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AN EXPERIMENTAL CRITIQUE OF THE BINET-SIMON SCALE.

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In the spring of 1913 the writer and two other members[1] of the Princeton psychological laboratory applied the Binet-Simon scale to 309 children in the first six grades of the Princeton Model School. The subjects may be considered as a fairly representative group of American children, coming for the most part, from the homes of laborers, artisans, farmers and tradesmen. Each of the school grades is divided into a plus and minus group, the latter division being under a different teacher, and containing those who either are backward, or who, on account of illness, change of school, or for reasons not necessarily related to their mental development, are not sufficiently far advanced to perform the work of their grade. The school system also contains a special class for backward and defective boys, and although this class was examined and furnished very interesting material, the data from these fifteen cases were not included in the subsequent statistical study of the tests. The distribution of the subjects of different ages in the various grades is shown in Table I.

[1]The writer wishes to acknowledge his gratitude to Prof. H. C. McComas and Mr. Prentice Reeves for their assistance in giving the tests, and to Prof. H. C. Warren for his valuable suggestions concerning the treatment of the data.

TABLE I.

DISTRIBUTION OF AGES IN GRADES.

Chronological Ages.

Grade.	6	7	8	9	10	11	12	13	14	15	16	Totals.
VI +	..	..	..	..	..	6	15	14	4	3	2	44
VI —	..	..	..	..	..	..	1	4	3	2	1	11
V +	..	..	..	..	4	14	12	6	2	2	..	40
V —	..	..	..	..	..	2	5	3	3	2	..	15
IV +	..	..	1	1	16	6	5	3	..	..	..	32
IV —	..	..	..	..	5	2	6	2	..	..	..	15
III +	..	..	5	17	11	2	1	..	..	..	..	36
III —	..	..	..	5	6	1	..	..	..	..	..	12
II +	..	5	18	4	1	..	..	..	..	..	..	28
II —	..	2	3	3	1	..	..	..	..	..	..	9
I +	1	13	11	..	..	..	..	..	..	..	..	25
I —	6	16	3	1	..	1	..	..	..	..	..	27
Totals....	7	36	41	31	44	34	45	32	12	9	3	294

The method used in giving the tests was, as far as possible, the same as that outlined by Henry H. Goddard in the 1911 revision of the article in "The Training School," January, 1910. The rules and suggestions for the standardized scoring and technique contained in that writer's article, in the same publication, April, 1913, were also followed as far as possible. The apparatus used was the standard set of material supplied by C. H. Stoelting Co. No tests in the series above "twelve years" were given. The children from the sixth grade were examined first, and the rest of the grades followed in descending order. One marked variation from the usual procedure was adopted. In no case did the experimenter know the chronological age of the child tested. This departure was made to eliminate any possible bias or prejudice on the part of the experimenter, and to determine whether or not an investigator could estimate the mental age of a subject with no other instrument at hand except the Binet-Simon scale. The grade was known, but this afforded slight information on account of the wide variations of the ages in grades, as may be seen in Table I. The actual ages were not obtained until the entire number of cases had been examined.

In treating the data, the method of age difference was adopted as that having the smallest possibility of error. Investigators vary widely in their methods of classifying the data obtained from the application of the Binet-Simon scale,

and a uniform method should be adopted. Data classified first according to the chronological ages and then according to the mental ages are liable to two sources of error: one, that from smoothing the chronological ages to even years; the other, that from smoothing the mental ages to even years. In some instances these errors operate in opposite directions and cause the displacement of certain cases. (For example, a case with a chronological age of 8.4 and a mental age of 8.6 would be displaced eight-tenths of a year if classified as 8 physically and 9 mentally. Or, a case with a chronological age of 8.6 and a mental age of 9.4 would be displaced eight-tenths of a year if classified as 9 chronologically and mentally.)

The classification by the differences between mental and chronological ages is liable to but one source of error—that from smoothing the figures to years or half-years. In a classification of this nature, the chronological age groups are used only as general headings, and in no way influence the position of the data. The writer would therefore suggest the following as the standardized method of classifying the results obtained from the Binet-Simon tests:

Calculate the chronological age in tenths or fifths of a year, as convenient; place the mental age in tenths or fifths, giving the subject credit for every test passed above the "basal age" (or that year in which all the tests are passed)—find the difference and classify by years or half-years, according to the amount of analysis the data will stand. In this study the chronological ages were calculated in tenths of a year, and the age difference computed in tenths.

The results of the tests of the 294 cases in the regular grades of the school, classified according to the method of age differences, are given in Table II.

It will be seen from the totals that the distribution of the cases is abnormal, in that too many of the cases test below age. The analysis of this total is shown in line A, B and C of Table II. From this it will be seen that the great majority (86%) of the cases over a year and a half below age are either over twelve[2] years of age or in the minus grades. The distribution

[2]Since no tests above "twelve years" were given, the 68 cases over twelve years of age cause part of the inequality in the distribution of cases above and below the "at age" position.

TABLE II.

DISTRIBUTION OF CASES OF VARIOUS AGES ACCORDING TO DIFFERENCES BETWEEN MENTAL AND CHRONOLOGICAL AGES.

Chronological age.	*Chronological Age ± Mental Age.*									
	−5	−4	−3	−2	−1	0	+1	+2	+3	Totals.
6.....	..	..	..	..	..	5	1	1	..	7
7.....	..	..	..	3	7	12	14	..	..	36
8.....	..	..	..	2	8	20	9	1	1	41
9.....	..	..	1	1	5	17	4	3	..	31
10.....	..	..	2	5	14	14	9	..	..	44
11.....	..	2	..	4	10	16	2	..	..	34
12.....	..	..	6	13	15	11	..	..	..	45
13.....	..	1	13	10	8	..	..	..	..	32
14.....	1	4	2	5	..	..	..	..	..	12
15.....	4	5	..	..	..	..	..	..	..	9
16.....	1	2	..	..	..	..	..	..	..	3
Totals.....	6	14	24	43	67	95	39	5	1	294
A.....	6	12	18	20	11	1	..	..	..	68
B.....	..	2	5	12	18	22	5	..	..	64
C.....	..	..	1	11	38	72	34	5	1	162

Line A—All cases over 12 years chronological age.
Line B—All cases under 12 years in minus grades.
Line C—All cases under 12 years in plus grades.

of the remaining cases, under twelve and in plus grades, is normal.

Conclusions from such totals, however, are apt to be misleading, since the measuring scale itself is not uniform, different tests being used for various ages. The scale might tend to over-estimate the intelligence of the younger cases and underestimate that of the older cases. In a mass result such positive and negative tendencies would be obscured. To determine the existence of these positive and negative tendencies, the cases were classified into groups according to the chronological ages, and the average difference between the mental and chronological age for each group was computed. Table III shows the average difference between the mental and chronological ages of the 270 cases examined, from six to thirteen years of age. The mean variation is shown in each case.

TABLE III.

AVERAGE DIFFERENCE BETWEEN PHYSICAL AND MENTAL AGE OF EACH CHRONOLOGICAL AGE GROUP.

Chronological age.	All Cases. No. of cases.	Average age difference.	Mean variation.
6	7	+ .20	.47
7	36	+ .05	.75
8	41	+ .08	.80
9	31	— .06	.80
10	44	— .51	.82
11	34	— .70	.87
12	45	—1.38	.81
13	32	—2.29	.63

From these results the conclusion may be safely drawn that the Binet-Simon scale graded accurately in the long run for the ages of 7, 8, 9, 10 and 11 years. (No conclusions may be drawn from the 6-year tests, on account of the small number of cases.) During the years 10, 11 and 12, the tests become increasingly difficult for the children of these years to pass. This difficulty is, for the most part, only apparent inasmuch as there are no tests above 12 by means of which a subject may help his grade by passing other tests above his "basal age." That this line of reasoning will not account for all the discrepancies in the twelve-year tests will be shown subsequently.

It has been shown that in the long run the Binet-Simon scale measured the development of intelligence with rather remarkable accuracy for each year of physical and corresponding mental growth. There still remains the possibility that certain cases have been misjudged by the scale, and that these failures have been smoothed over in the mass results for each year. In order to determine the existence of such exceptional cases, the results of the tests were compared with the teachers' judgments. The teacher of each grade was asked to grade the children into five groups: "very bright," "bright," "average," "dull" and "very dull." They were instructed to grade the child according to his native capacity, regardless of his attainments or conduct in the class room. The instructions were uniform for all teachers. The judgments were made from six to seven months after the

children had left the supervision of each teacher, so that small prejudices would be forgotten. To obtain a check on the teachers' judgments, the principal also classified the children into the five groups mentioned above. The principal knew most of the children personally, and had had ample opportunity for skilled observation. If the principal was not able to judge a child, the case was thrown out. Two hundred and fifteen cases under twelve years of age were thus judged by both the teachers and the principal. The judgments concerning the child's mental capacity coincided in 41 per cent. of the cases. In 50 per cent. of the cases the judgments varied a magnitude of one group. (For example, a child judged "average" by the principal might be judged "bright" by the teacher, etc.) In 9 per cent. of the cases the judgments differed by two groups, *i. e.*, a child judged "average" by the teacher would be judged "very bright" by the principal, etc. The cases included in this 9 per cent. were thrown out, leaving 194 cases in which there was a correspondence of not less than one group.

The 194 cases so graded were then classified into five groups according to the teachers' judgments. Table IV shows the average difference between the mental and chronological ages for all cases within each group, compared with the mean variation and number of cases for each group.

TABLE IV.

AVERAGE AGE DIFFERENCE OF EACH GROUP FORMED BY TEACHERS' JUDGMENTS.

Teachers' judgments.	No. of cases.	Average age difference.	Mean variation.
Very bright	17	+ .91	.65
Bright	40	+ .03	.49
Average	83	— .47	.78
Dull	45	— .94	.87
Very dull	9	—1.8	1.3

From these results the conclusion is safe that in the long run the Binet-Simon scale measured and accurately graded fairly minute individual differences in mental ability. Table V shows the distribution of the cases in the five groups according to the differences between the mental and chronological ages.

TABLE V.

DISTRIBUTION OF THE CASES IN THE FIVE GROUPS, FORMED BY TEACHERS' JUDGMENTS ACCORDING TO AGE DIFFERENCES.

Teachers' judgments.	*Chronological Age ± Mental Age.*								
	−4	−3	−2	−1	0	+1	+2	+3	Totals.
Very bright.....	..	..	..	*1*	*4*	8	3	1	17
Bright	..	..	..	*6*	26	7	1	..	40
Average	..	*1*	*11*	25	35	*11*	..	..	83
Dull	*1*	3	8	17	*12*	*4*	..	..	45
Very dull.....	1	3	1	*2*	*1*	*1*	..	..	9

From this table it will be seen that the cases do not group about the norms as closely as might be expected. Certain exceptional cases, such as the four children judged "very bright," who tested at age, and the one who tested below age, must be explained in some other way. The cases in italics are apparently exceptional. Inasmuch as a difference of two groups between the judgments of the teachers and the principal was considered grounds for throwing out those cases so judged, the same rule was adopted in this instance. Those cases in each group were considered to be exceptional that tested higher or lower than the average of two groups above or below this group. (For example, a child testing lower than −0.47, who was graded "very bright" by the teacher, was considered an exceptional case.)

Thirty cases were thus determined to be exceptional. Of these thirty cases, nineteen were placed in the next group above or below the proper one by the principal. (For example, a case graded "very bright" by the teacher which had been thrown out for testing −0.5 would be graded "bright" by the principal, thus placing it within the proper range of the "bright" group.) In such cases there was at least a difference of opinion, and that difference was in the direction indicated by the tests. This fact tends to corroborate the findings of the Binet-Simon scale rather than impair them. Three of the remaining eleven cases were under-age for their grade, and were ranked "dull" or "very dull" by the teacher and principal. These differences can again be reconciled, since the Binet-Simon scale purports to measure the mental capacity of an individual, not his scholastic attainments. The re-

maining eight cases have no obvious explanation. They constitute 4 per cent. of all the 194 cases treated above. Since the judgments of the teachers and the principal did not coincide within two groups in 9 per cent. of the cases, and since their judgments actually coincided in only 41 per cent. of the cases, the assumption is legitimate that the error of 4 per cent. is on the part of the judgment of the teacher and principal, and not the Binet-Simon scale.

Up to this point, conclusions concerning the Binet-Simon scale have been qualified by "in the long run," which means that mass statistics obscure exceptional individual cases. In the light of the last individualistic study, the conclusion is certainly justified that the Binet-Simon scale actually measured and graded the development of intelligence from seven to eleven years, and was an adequate measure of individual differences at any of these ages. This conclusion may be qualified by defining "accurately measured" as a correct measure 96 per cent. of the time, but there is strong probability that this measure approached complete accuracy.

From the results shown in Table III, it would seem that the 12-year tests were too difficult, since the average difference between the mental and chronological age of thirty-two children twelve years of age is —1.38 (M.V. 0.81). This difference may be partly explained by the fact that there are no suitable tests[3] above "twelve" by which a subject might increase the results above his "basal age."

In order to determine the value of the "twelve-year" tests, twenty 12 and eight 13-year-old subjects were selected. The twenty-eight subjects comprised all who were of American parentage, up to grade, and who were not graded lower than "average" by either the teachers or the principal. Table VI shows the manner in which this selected group of 12 and 13-year-old subjects passed the "twelve-year" tests.

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[3]The tests given under "fifteen" are valueless for practical purposes. The emotional evaluation of pictures admits of slight standardization. The "code test" and "clock-hand test" involve highly specialized visual memory, while in the "opposites test," the words are not of uniform difficulty for all children.

TABLE VI.

MANNER IN WHICH SELECTED GROUPS OF TWELVE AND THIRTEEN-YEAR CASES PASSED THE "TWELVE-YEAR" TESTS.

Test.	No. times given.	Percentage passed.
Repetition of seven figures	28	68%
Definition of abstract words	27	44%
Repetition of sentences	28	11%
Line suggestion	28	71%
Comprehension of situations	25	40%

The test for the repetition of seven figures and the line suggestion test were apparently satisfactory. The definitions of abstract words were probably too difficult. The repetition of the sentence of twenty-three syllables was undoubtedly too difficult. The comprehension of the two complex situations seemed to be too difficult, probably because the situations given in the standardization were quite foreign to the experience of the children tested.

Before an investigator makes a judgment on the mentality of a child twelve years old or above, he should add a constant to the mental age to correct the imperfection of the scale in this region. The average difference between the mental and chronological ages of the twenty selected 12-year-old subjects (average age 11.9) was —0.73 (M.V. 0.47). The average age difference of the eight selected 13-year-old subjects (average age 12.9) was —1.66 (M.V. 0.36). This would indicate that the constant to be added should not be less than —0.7. To this constant should be added the difference between the chronological age and twelve.

A subject testing two years or more below the chronological age is usually considered "backward." This judgment is based on practical experience. The average mean variation for all subjects was 0.75. The normal range of cases due to individual differences, therefore, fell within twice the magnitude of the mean variation or within one and a half years. A case would be considered exceptional that fell over a year and a half above or below the average age difference of its particular age group.

The influence of the personal equation of the experimenters upon the results of the tests do not admit of accurate determi-

nation. One experimenter examined more of the older children than the others, while one examined more cases from the minus grades. The figures based on such results could not be considered comparable in studying the effect of the personal equation. The elimination of such disturbing cases left too few to give a representative figure. However, in every method by which the results were treated to bring out the influence of the personal equation, that influence never amounted to more than one-third of the average mean variation, a value too small to be considered significant.

Summary.

Under the conditions of the experiment, the following conclusions would appear to be true:

1. The Binet-Simon scale, as now standardized, was found to measure various stages reached in the development of the intelligence of the children examined, from seven to eleven years of age, with at least 96 per cent. efficiency.

2. The scale served as an adequate measure of comparatively slight individual differences in groups of the same chronological age.

3. The "twelve-year" tests were found to be unsatisfactory.

4. The average range of variations due to individual differences was a year and a half.

5. The standardized method of classification should be that by age differences.

FURTHER EXPERIMENTAL RESEARCHES ON LEARNING TO SPELL.

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I. Why Further Experiment Is Necessary.

It is, perhaps, more common for an experimenter to be persuaded by others that further research is required on the matter he has dealt with than to publish dissatisfaction with his own results. And I cannot claim, indeed, that I should always succeed in maintaining such a high standard of objectivity. But in this case the general trend of my views on educational psychology and, above all, the great importance I attach to experimental pedagogy in contradistinction to psychology for teachers, and the very dubious pronouncements of experimental psychology on the question of learning to spell, minimize any reluctance I might feel in publishing results which, quite consistently and regularly, are the complete reverse of those which I published in the Journal at the close of last year.

It may be remembered that I then expressly disclaimed any intention of generalizing the results beyond the evidence. The results, perfectly clear and definite as they were, belonged to one school only, apparently to all the classes of the school, but still to one school only. The children were those of Jewish aliens in a poor district down east in London. They were young, and not of a high level of mental development; they were all boys, and the pedagogical methods of the school were not generally such as favor self-reliance and independent work, though changes were being made in this direction. I suggested that it would be necessary to try similar experiments in schools of different character. But it is quite useless, just in a haphazard way, to try here and there with no guiding principles and no expectation as to probable results; so let me briefly sketch the considerations which led me to choose my second school. Let me remind the reader that I am looking for results to enable me to decide between the claims of a

combined method with visual, auditory and articulatory factors as against a silent visual method of learning to spell. First of all, knowing that, age for age, girls have better memories than boys, I thought I would try the experiment in a girls' school. Secondly, I chose a school which contained all standards up to VII, so that I could work with classes covering a wider range of age and proficiency than had been possible in the down-east boys' school. Thirdly, I chose a school in a fairly good neighborhood attended by children of good ability. And fourthly, the pedagogical methods of the school laid much more stress on silent and individual work than in the boys' school. Fifthly, of course, I selected a school in which the head had a scientific interest and much experience in experimental pedagogy. If with all these important differences the results were precisely the same as in the preceding school, there would be strong grounds for wide generalization.

II. The Co-operation of the Teacher.

I have on more than one occasion published the opinion that without the co-operation of teachers there will never be in any appreciable sense a science of education, and today I should like to go a step further and say that if teachers stand aside and do not help, they will only have themselves to thank if methods are imposed upon them from the results of experiments which they do not understand, which are not really applicable to their work and in which they have had no share. Personally, I have had no difficulty in obtaining willing coworkers among teachers for as many experiments on learning to spell as I could personally supervise.

III. General Plan of the Second Series of Experiments.

A detailed account is not necessary, since this series of experiments followed precisely the same lines, in gross and in detail, as those of the experiments described in this Journal in November and December last. As before, the subject-matter of the work done consisted of actual words in each of the classes tested. Two lists of words of equal difficulty were prepared for each class or standard; and their equality was tested

in a preliminary exercise. Then the children were subjected to a practice-period, in which one set of words was learnt in one way and the other learnt in another way. The details are given in a paragraph entitled *How Each Test Was Learnt in the Practice Series*, to be found on pages 531 and 532 of this JOURNAL last year. Suffice it to say here that the words of Set A were learnt by a combined method (with visual, auditory and articulatory factors), with attention throughout directed by the experimenter, whilst the words of Set B were learnt visually and silently, each pupil working without the stimulus or interference of the teacher's direction word by word, which was operative in the work done with Set A. The experiment was carried out with four classes or standards, ranging from Standard II, with an average age of 8 years, to Standards VI and VII (one class, taught by one teacher), with an average age of 13 years. I propose to begin my account with the spelling of Standards VI and VII, the first class of this elementary school. The character and methods of the school have already been described by implication in the previous section, entitled *Why Further Experiment Is Necessary*.

IV. AN EXPERIMENT WITH STANDARDS VI AND VII.

Thirty-two Girls with An Average Age of 12 Years 9 Months.

First I give the lists of words used in this class:

The List of Words Called Set A.		*The List of Words Called Set B.*	
sufficient	mosquitoes	existence	pavilion
zephyr	chasm	sulphur	bachelor
achievement	piecemeal	pyramid	variety
nymph	hideous	roguish	anxious
appropriate	ceremony	intricacy	embroidery
mysterious	solemn	juiciest	accidental
campaign	abyss	chivalrous	equipped
triumphant	prophesy	precipice	interview
hostelry	crystal	atmosphere	inquisitive
recognized	deity	enthusiasm	society
vigorous	temptation	dungeon	overwhelm
scimitar	dolphin	villain	cruise
melancholy	eloquent	suspicion	avenue
mischievous	banquet	treacherous	vouchsafe
pageants	discern	invincible	ancient

The score of correct spellings in the preliminary test with the 30 words of Set A was 16.3 (mean variation 4.7), and with the 30 words of Set B was 16.3 (mean variation 4.8). The

equality of the two sets in relation to the knowledge of these girls *before* the practice period is therefore clear.

This preliminary test was given on Monday at 9.45 of June 23, 1913. The practice-periods for Set A were on Tuesday at 9.45, Wednesday at 2.05 and Thursday at 9.45 of the same week. The practice-periods for Set B were on Tuesday at 2.05, Wednesday at 9.45 and Thursday afternoon at 2.05 also of the same week. Each practice-period lasted 10 minutes. If any advantage of position in school time accrued to either set of words, it would usually be believed that Set A had the advantage. The final test, given in order to see which method of learning had been the more successful, was given on Friday at 9.45, June 27.

In the final test the girls scored 25.9 (mean variation 3.0) correct spellings with the 30 words of Set A and 27.6 (mean variation 2.5) with those of Set B. It *appears,* therefore, that the silent method has been the more successful; but a closer analysis is needed in order to make sure. This analysis follows:

TABLE I, *Showing, Section by Section, the Number of Words Spelt Correctly Before and After Learning.*

No. of words of Set A correct before learning.	No. of girls.	Before learning. Av. No. right in Set A.	Before learning. Av. No. right in Set B.	After learning. Av. No. right in Set A.	After learning. Av. No. right in Set B.
20 to 27	8	22.8	22.4	29.3	29.8
15 to 20	11	18.5	18.6	27.2	29.3
10 to 15	8	12.3	12.0	23.0	25.9
5 to 10	5	7.8	8.6	22.2	22.6

Beatrice B———, one of the girls in the lowest section, is a native of Sierra Leone; she is by no means "unintelligent," using this word in the ordinary loose sense, but she is weak in school work and spells badly, and though she tried very hard, she made a "poor show" by the visual method, scoring 17 right in the final tests, whilst with the combined method she scored 27. In one other case, and in one other only, the case of Sarah C———, who was dexterous manually, but not generally highly proficient mentally, did the combined method score above that of visual silent work. Any teacher trying this experiment should, of course, make out the table of individual results in full; but in this article space can only be given for summaries.

The correlation-coefficient between the results of the preliminary tests was +.95; the difference between the means was 0, and the probable error of the difference was .2. In the final tests the correlation-coefficient was +.65; the difference between the means was 1.7, and the probable error of this difference was .36. The difference between the final averages is therefore five times its probable error, a conclusive evaluation of the *general* superiority of the silent visual method. The superiority of the silent method *individually* has already been referred to.

V. The Interpretation of the Results from Standards VI and VII.

This result is in direct conflict with those obtained from the poorly-situated boys' school down east. How shall we explain this difference? It would not be difficult if we confine ourselves to this class only. For these are girls, and they are older and mentally more developed children than those of the boys' school, and have been more habituated to individual silent work. Let us, for the moment, leave it at that and see how far further experiments with lower classes of the same girls' school agree with those of this class.

VI. An Experiment with Standard IV.

Thirty Girls with An Average Age of 10 Years 3 Months.

The following were the words used in this class:

The List of Words Called Set A.		*The List of Words Called Set B.*	
prophesy	recognize	zephyr	dolphin
mosquitoes	existence	intricacy	triumphant
chasm	cruise	campaign	pavilion
treacherous	bachelor	hostelry	precipice
scimitar	villain	enthusiasm	equipped
atmosphere	variety	achievement	mysterious
nymph	piecemeal	Abyss	sufficient
pyramid	crystal	vigorous	suspicion
melancholy	society	accidental	dungeon
sulphur	hideous	overwhelm	discern
pageant	inquisitive	embroidery	avenue
appropriate	ceremony	juiciest	anxious
chivalrous	deity	solemn	vouchsafe
roguish	temptation	interview	eloquent
invincible	banquet	mischievous	ancient

The preliminary test was given on Friday at 2.05, June 6, 1913. The practice-periods for the words of Set A were on Wednesday at 9.45, on Thursday at 2.05 and on Monday at 9.45; for the words of Set B the practice or learning-periods were on Wednesday at 2.05, on Thursday at 9.45 and on Monday at 2.05. The time given for learning each set was therefore 30 minutes. The advantage in chronological position, if there is any, rested with the words of Set A. The final test of the series was given on Tuesday, June 17, at 9.45.

From a list of individual results I find that only six children out of the thirty have done better by the combined than by the silent visual method. No less than twenty have done better by the silent method, and there are four cases where the final results by the two methods are equal. So much for the results given *individually:* they will be shown *generally* in two ways—firstly, by means of a grouped correlation table; secondly, in a succinctly summarized statistical evaluation.

TABLE II, *Showing, Section by Section, the Number of Words Spelt Correctly Before and After Learning.*

No. of words of Set A correct before learning.	No. of girls.	Before learning. Av. No. right in Set A.	Before learning. Av. No. right in Set B.	After learning. Av. No. right in Set A.	After learning. Av. No. right in Set B.
10 to 20	7	11.9	12.0	23.6	24.7
5 to 10	12	7.1	7.0	18.0	19.5
0 to 5	11	2.7	2.7	12.7	15.2

Before learning, the average mark for Set A was 6.6 (mean variation 3.1 and standard deviation 3.8).

After learning, the average mark for Set A was 17.4 (mean variation 6.5 and standard deviation 7.0).

Before learning, the average mark for Set B was 6.6 (mean variation 3.7 and standard deviation 4.3).

After learning, the average mark for Set B was 19.1 (mean variation 4.9 and standard deviation 5.8).

The correlation-coefficient between the results of the preliminary test was +.89; the difference between the means was 0, and the probable error of that difference was .24. For the results of the final test the correlation-coefficient was +.89; the difference between the means was 1.7, and the probable error of that difference was .39. The difference between the averages is again almost five times its probable error, a conclusive difference in favor of the silent method.

VII. The Interpretation of the Results from Standard IV.

The silent visual method has again scored a victory. But it was conclusively beaten when used by the Standard IV class of *boys* of about the same age in my previous research. How are we to account for this discrepancy? It is obvious that we are dealing with some difference more vital than that of a difference in school-standard and a difference in age. Just now it had seemed that the silent method might be the better only with older girls, and those, moreover, of a higher school standard than the boys. In this crude form the hypothesis is obviously untenable, for these Standard IV girls have also succeeded best by a silent visual method. These girls are, however, distinctly above the boys of the *same standard* in the down-east school in general mental proficiency, so that we are not entirely driven away from the notion lying below the crudely-worded hypothesis. Let us try with a still lower class of girls in the same school. I present next the results of an experiment, similarly conducted and directed to the same issues, which was carried out with the Standard III class, the class immediately below that for which the results have just been given.

VIII. An Experiment with Standard III.

Twenty-six Girls with An Average Age of 9 Years 4 Months.

The procedure was identical with that of the experiments previously recounted. The following lists of words were found satisfactory:

The List of Words Called Set A.		*The List of Words Called Set B.*	
preferred	saluted	swindled	allotted
determined	permanent	traveller	business
swiftly	resolved	scaling	succession
lightened	pursued	harnessed	ordinary
earthquake	arrangement	companions	transported
security	dainties	occasion	kindled
portal	consequence	chamber	disturbance
constitution	infringe	consultation	shield
separate	avoid	aggregate	piteous
groaning	pierced	heavily	exertion
dawned	avenge	forlorn	pitched
desperate	signal	struggle	monarch
curiosity	electric	outrageous	execute
character	denounce	continual	fashion
necessary	torch	preparations	wrapped

The preliminary test was given on Tuesday, July 8, at 9.45. The practice-periods for the words of Set A were on Wednesday at 9.45, on Thursday at 2.05 and on Friday at 9.45; those for Set B were on Wednesday at 2.05, on Thursday at 9.45 and on Monday at 2.05. The chronological position of the learning-periods possibly gave a slight advantage to Set A. The final test was given on Tuesday, July 15, at 9.45. A slip in the procedure on Monday, July 14, must be mentioned. The Head Mistress, who had conducted the tests and exercises throughout, was suddenly called from the class. The teacher *spelt* the words of Set B to the children as well as pronounced them, instead of merely pronouncing them. I am unable to say whether this variation in the procedure increased the advantage which Set B was subsequently found to possess or did not increase it; but it is certain that Set B had a more than usual advantage in this class, though it consisted of younger children. From a list of individual results it is seen that out of twenty-six cases there are only three in which the combined method proves to be the more successful, and two of these cases are in the lowest section. The general results may be tabulated as follows:

TABLE III, *Showing, Section by Section, the Number of Words Spelt Correctly Before and After Learning.*

No. of words of Set A correct before learning.	No. of girls.	Before learning. Av. No. right in		After learning. Av. No. right in	
		Set A.	Set B.	Set A.	Set B.
10 to 15	5	12.4	11.2	21.2	24.2
5 to 10	8	6.5	6.3	17.8	20.5
2 to 5	7	3.3	4.0	13.0	16.0
0 to 2	6	0.2	1.0	5.2	7.8

The result is, on the whole, congruent with those from the higher classes in this school, the silent method has proved the better; but the two lower sections are not as nicely balanced in the preliminary test as one would wish, and though among the thirteen girls at the bottom of the list (the lowest section and the one immediately above) there are two only who gain higher marks by the combined than by the purely visual method; yet, calculated as *percentage* improvements on their initial position (their position in the preliminary test), the work of the lowest section but one is scarcely better by the

silent method than by the combined method with directed attention, whilst the *percentage* improvement of the lowest section is definitely greater by the combined method. Still, there is no doubt that, even for this class, the silent method has clearly won, on the whole, as may be seen from the following statistical summary:

Before learning, the average mark for Set A was 5.3 (mean variation 3.5, standard deviation 4.3).

After learning, the average mark for Set A was 14.2 (mean variation 5.6, standard deviation 6.9).

Before learning, the average mark for Set B was 5.38 (mean variation 3.1, standard deviation 3.8).

After learning, the average mark for Set B was 17.1 (mean variation 6.3, standard deviation 7.5).

The correlation-coefficient between the results of the preliminary test was +.95; the difference between the means was .1, and the probable error of that difference was .19. For the results of the final tests the correlation-coefficient was +.94; the difference between the means was 2.9, and the probable error of that difference was .32—that is to say, the difference between the average is more than nine times its probable error.

IX. The Interpretation of the Results from Standard III.

Once more the silent method has gained the victory quite conclusively as regards the class as a whole; but it must be added, very doubtfully, if at all, in the two lowest sections of the class. It may be that we are approaching, even in this school, the lowest limit at which the silent method proves the more profitable. It is possible that the crude notion previously referred to, namely, that the silent method is better for abler children and the combined method more profitable for those mentally less developed, may yet be the most satisfactory conception to summarize our results, to make them intelligible and to enable us to draw conclusions of value to pedagogical method. But let me, before further discussion, give the results of a similar experiment carried out with a standard still lower.

X. The Experiment with Standard II.

Twenty-seven Girls with An Average Age of 8 Years 0 Months.

This was the lowest class in this girls' school, since the Standard I class was taught in the infants' department of the school.

The lists of words used were as follows:

The List of Words Called Set A.		*The List of Words Called Set B.*	
yellow	habit	crimson	nature
Tuesday	needle	Wednesday	insect
angry	spider	laugh	beetle
beauty	thrush	dawn	robin
ugly	flower	vexed	wrong
learning	cousin	history	uncle
pathway	study	gallop	humble
scholar	board	industry	coach
rapid	lesson	youth	value
essay	iron	quack	fasten
glasses	listen	doctor	brass
wonderful	shout	balance	scale
creature	beads	useful	coal
month	object	calf	peach
second	apple	fourth	ground

The preliminary test was given on Wednesday, July 16, 1913, at 9.45. The practice-periods for Set A were on Thursday at 9.45, on Friday at 2.05 and on Monday at 9.45, July 21; those for Set B were on Thursday at 2.05, on Friday at 9.45 and on Monday at 2.05, July 21. The final test was given on Tuesday, July 22, at 9.45. As usual, the words of Set A were learnt by the combined method and the words of Set B by the silent and more exclusively visual method.

From a list of individual results there are found eight cases out of twenty-seven in which the combined method proves the better; there are eight cases in which the visual method appears the better, and there are ten cases in which the marks obtained in the final test are precisely the same by both methods. We are evidently in the neighborhood of the point of balance between the methods, so to speak.

Table IV, *Showing, Section by Section, the Number of Words Spelt Correctly Before and After Learning.*

No. of words of Set A correct before learning.	No. of girls.	Before learning. Av. No. right in Set A.	Before learning. Av. No. right in Set B.	After learning. Av. No. right in Set A.	After learning. Av. No. right in Set B.
20 to 27	7	21.7	21.1	28.0	29.0
15 to 20	7	17.3	17.3	28.1	27.7
5 to 15	5	10.4	9.6	21.2	20.0
0 to 5	8	2.0	2.0	4.5	6.0

Before learning, the average mark for Set A was 12.6 (mean variation 7.3, standard deviation 8.1).

After learning, the average mark for Set A was 19.8 (mean variation 9.3, standard deviation 10.5).

Before learning, the average mark for Set B was 12.3 (mean variation 7.3, standard deviation 8.0).

After learning, the average mark for Set B was 20.2 (mean variation 8.9, standard deviation 10.3).

The correlation-coefficient between the results of the preliminary test was +.98; the difference between the means was .3, and the probable error of this difference was .23. For the results of the final test the correlation-coefficient was +.98; the difference between the means was .4, and the probable error of this difference was .27. Thus the difference between the means, though favoring the silent method, is only one-and-a-half times its probable error. The advantage, therefore, is *not* a general one, as indeed was seen even more distinctly from the individual results previously shown.

XI. The Interpretation of the Results for Standard II.

We seem at last to have reached a point of indifference as far as the class as a whole is concerned, and I much regret that the absence of a Standard I class in this girls' school prevented me from carrying my researches lower down under the same conditions. It seems likely, if we went lower still, that the combined method would gain the victory even with the well-developed girls of this favorably-situated school.

XII. General Conclusions.

Probably the most important conclusion for experimental pedagogy arises from the apparent conflict between these results and those previously given from the down-east boys' school. It seems quite clear that experiments must be carried out in a number of schools under widely-differing circumstances before they can be of any general practical value. Inferences from occasional tests in particular schools cannot be generalized much beyond the conditions in which the tests

are given. Yet, somehow we must put things together, and, pending the day, if it ever arrives, when teachers, by means of experiments like these, can find out for themselves what is best for their particular classes, nay, more, for their particular children, we must gather what guidance we can from such valid results as we may happen to have. What, then, shall we say about the comparison of our two methods, having regard to the results from both our poorly-situated boys' school and our well-placed girls' school? I leave aside for the present the consideration that the differences may be due to sex. I suggest that the degree of mental development is roughly the determining factor, modified somewhat by prevailing school-methods. On both the counts the girls were the more advanced; and except in the lowest class the silent visual method has definitely won, whereas in the boys' school the combined method was clearly the better throughout. In schools in "poor" neighborhoods, and even in good neighborhoods with poorly-developed children, there is still much which may be done with combined stimuli and attention directed, word by word, by the teacher. With older and mentally more developed children the silent visual methods are better. But of course, there is a further consideration: we must, in education, look forward rather than backward, and as soon as there is a reasonable probability that children will succeed as well by silent individual methods, they should be adopted. Both ways of learning have been shown to be good ones, but the method of life is a visual one; and let us hope, for the sake of our neighbors' comfort, a silent one, too, so that we are really preparing for life by using this method as soon as we can. But I do not wish to be understood to assert that there is no place for a method of combined stimuli; they are probably the best for poorly-endowed and very young children. And for such children it is scarcely too much to say that the subject-matter is more than the method; they must learn how they best can. For older and cleverer pupils, method, as a conscious process, is more important; but as this doctrine is generally accepted in the best current pedagogy, I need not labor it here.

A COMPARISON OF THE ARITHMETICAL ABILITIES OF RURAL AND CITY SCHOOL CHILDREN.[1]

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Source of the data. The data of this paper were obtained by giving the Courtis tests in arithmetic to the third, fourth, fifth, sixth, seventh and eighth grades in a number of rural schools in a county in Illinois. The schools are thought to be fairly representative of the rural schools of the county.

The tests were given by the county superintendent of schools of the county and by the writer, except in one school, where they were given by the teacher. The tests were given under the conditions recommended by the author of the tests, except that in each school all of the tests were given at one sitting, instead of four at one time and four at another, as recommended.

The tests were first given to 28 schools. This will be called Test A. Four and one-half months later the tests were given a second time in 12 of these schools. This will be called Test B.

Test A.

Test A consisted in giving the Courtis tests to 309 pupils in 28 rural schools. The average scores made by these pupils are given in Table 1. This table gives for each grade the average number of attempts in addition, subtraction, multiplication, division and copying figures; and in Tests 6, 7 and 8 the average number of attempted (A) and correct (R) solutions of problems involving reasoning and the fundamental operations. The time given to each test is given at the bottom of the table. This is the same for all tables.

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[1]Read before the Child Study Section of the Illinois State Teachers' Association, December, 1913.

TABLE 1.—*Average Scores by Grades in Rural Schools.*

No. of pupils.	Grade.	Test. 1—Add.	2—Sub.	3—Mul.	4—Div.	5—Copying.	6—Speed Reas. A	6—Speed Reas. R	7—Fundamentals. A	7—Fundamentals. R	8—Reasoning. A	8—Reasoning. R
53	3d.....	15.7	10.9	6.2	5.6	42.8	...	...	2.5	0.4	...	...
58	4th.....	25.0	17.8	14.0	12.1	57.9	1.6	0.9	6.5	2.3	1.2	0.2
22	5th.....	27.5	20.1	16.7	14.3	65.0	1.7	1.3	6.9	2.7	2.2	0.1
76	6th.....	33.7	25.6	24.7	22.8	76.2	3.1	2.5	8.0	4.2	1.9	0.6
19	7th.....	42.6	29.3	33.3	32.8	93.8	4.3	3.6	10.0	6.4	2.3	0.1
81	8th.....	45.3	35.6	34.0	33.3	85.3	4.3	3.4	11.1	6.7	3.1	1.5
Time in minutes		1	1	1	1	1	1		12		6	

TABLE 2.—*Average Scores by Grades of 7008 Children, Nearly All in City Schools.*

Grade.	Test. 1	2	3	4	5	6 A	6 R	7 A	7 R	8 A	8 R
3d.....	26	19	16	11	63	2.8	2.1	5.4	1.7	2.7	0.6
4th.....	33	25	23	21	70	3.7	2.5	6.6	3.6	2.6	0.8
5th.....	40	32	30	28	80	4.4	3.4	9.0	5.3	2.8	1.2
6th.....	46	37	34	35	88	5.1	4.4	10.3	6.9	3.4	1.7
7th.....	51	40	38	38	98	5.9	5.2	11.5	7.6	3.7	2.2
8th.....	57	45	43	44	102	6.8	6.1	13.1	8.9	4.1	2.7

Table 2 is one published by Courtis,[2] and gives the average scores made by 7008 children, the most of whom were in city schools. These averages were obtained from data coming from various parts of the United States, and seem to furnish a fair basis of comparison between city and rural children. It should be said, however, that the scores in Table 2 are generally lower in the tests on the fundamental operations and higher in the tests in reasoning than other tables published by Courtis of scores obtained in certain city school systems.

Comparison of the scores in Tables 1 and 2. The scores of the 3d Grade in Table 1 are one grade below the scores of the 3d Grade in Table 2, except in Test 5, where they are less than one grade below.

The scores of the 4th Grade in Table 1 are one grade below the scores of the 4th Grade in Table 2, except in Test 7, attempts, where the scores are nearly the same, and in Test 5

[2]STUART A. COURTIS, *Standard Scores in Arithmetic.* Elementary School Teacher, Vol. 12, p. 133.

and Test 7, rights (correct results), where the differences are less than one grade.

The scores of the 5th Grade in Table 1 are almost two grades below the scores of the 5th Grade in Table 2, except in Test 7, attempts, where they are less than one grade below.

The scores of the 6th Grade in Table 1 are almost two grades below the scores of the 6th Grade in Table 2, except in Tests 5 and 7, where they are a little more than one grade below.

The scores of the 7th Grade in Table 1 are generally more than one and less than two grades below the scores of the 7th Grade in Table 2, except in Test 5, where they are less than one grade below.

The scores of the 8th Grade in Table 1 are at least two grades below the scores of the 8th Grade in Table 2, except in Test 7, attempts, where they are slightly more than one grade below.

According to the plan of the Illinois State Course of Study, which was in use in these schools, the work of the 5th and 6th Grades and of the 7th and 8th Grades is alternated in successive years. Because of this alternation the work of the 5th and 7th Grades was not given in some schools. Hence there were some 5th Grade pupils doing 6th Grade work, and some 7th Grade pupils doing 8th Grade work. If proper allowance could be made for this, the scores of the 6th and 8th Grades would probably not be so low as given in Table 1.

A comparison of the scores in Tables 1 and 2 is most easily made by examining the graphs in Figure 1. These graphs furnish also a comparison between the scores in Tables 1 and 2 and the Standard Scores published by Courtis in 1913.[3]

The graphs are so made that the graph for a pupil making the Standard Scores in the 3d Grade, for example, would be a line parallel with the top and bottom of the figure, and in the middle of the spaces opposite the number of the grade. The continuous lines are the graphs of the scores made in the rural schools, Table 1, and the broken lines are graphs of the scores in Table 2. If, for example, the two lines representing the scores in the 8th Grade are followed across the figure, it is

[3]STUART A. COURTIS, *Second Annual Accounting*, 1912-1913, p. 20.

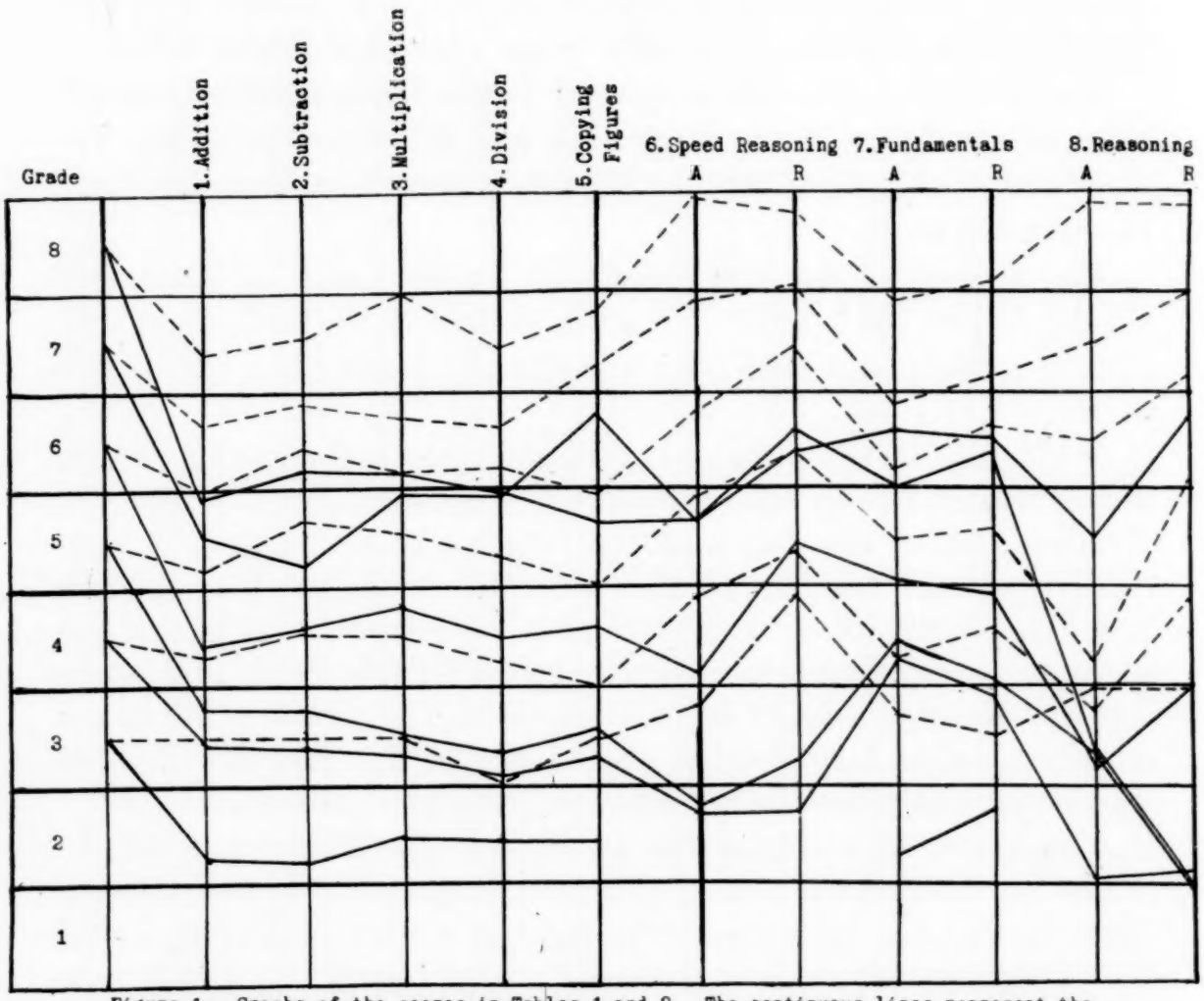

Figure 1. Graphs of the scores in Tables 1 and 2. The continuous lines represent the scores in Table 1, and the broken lines the scores in Table 2.

easily seen how much the scores in Tables 1 and 2 differ, and how far these scores are above or below the Standard Scores.

TABLE 3.—*Rural Schools. This Table Gives the Percentage of Correct Answers for Each Grade in Each Test (Except 5), and for the Totals in All Tests (Except 5) in Each Grade.*

	Test.							
Grade.	1	2	3	4	6	7	8	Total.
3d.....	93.4	74.8	54.8	41.8	....	17.6	....	70.9
4th.....	96.9	90.3	75.7	84.2	55.3	35.8	12.5	82.7
5th.....	95.3	92.5	86.8	87.4	75.7	39.1	4.1	86.0
6th.....	96.7	96.1	87.9	94.7	70.2	52.4	29.7	89.7
7th.....	98.4	97.2	82.1	94.5	82.9	63.7	45.5	90.4
8th.....	97.4	96.1	86.2	94.9	79.1	60.6	48.4	90.5

Accuracy. Table 3 gives the percentage of correct answers for each grade in each test, except Test 5, and the percentage of correct answers in the total scores, except Test 5, in each grade.

The errors in Tests 1, 2, 3 and 4 have generally been omitted in discussions of the results of the Courtis tests. That these errors are not negligible is shown by Table 3.

The large number of errors in Test 3 shows that the pupils do not know the multiplication table. The low percentages of correct answers in Test 7 emphasizes a fact that is well known—that the pupils are very inaccurate in performing the fundamental operations.

The average percentages of accuracy in Tests 6, 7 and 8 are considerably lower for rural than for city schools, as a glance at the results in Tables 1 and 2 will show.

TEST B.

At the time of Test A the teachers and the pupils in the schools tested were told that the tests would be repeated later in the year, and were urged to make an effort to increase their scores. Directions and devices for drill in the fundamental operations were given to some teachers, and they were urged to use the first five minutes of the recitation in arithmetic for this drill.

After about four and one-half months the tests were repeated in 12 schools. This is called Test B. The average scores made in the 6th and 8th Grades in Test B are given in

Table 4. In Table 4 are also given the average scores made in Test A by those pupils who took Test B. The scores of the 6th and 8th Grades only are shown, because of the small number of pupils in the other grades who took Test B.

TABLE 4.—*Rural Schools. Average Scores in the 6th and 8th Grades in Two Tests, A. and B, which Were Separated by an Interval of 4½ Months.*

Grade.		1	2	3	4	5	6 A	6 R	7 A	7 R	8 A	8 R
6th	A	36.4	27.2	27.2	27.0	69.6	3.1	2.2	8.7	4.6	2.1	0.8
	B	41.7	33.2	35.1	33.4	94.0	4.8	3.8	9.8	6.5	3.2	1.0
8th	A	45.4	35.3	31.5	33.3	79.9	4.4	3.6	11.2	6.3	3.3	1.9
	B	53.7	39.4	40.2	40.7	104.1	6.1	5.3	13.0	8.0	4.2	2.0

A comparison of the results of Test B with those of Test A shows that both the 6th and the 8th Grades have advanced at least one grade, and on the average about one and one-half grades. Some advancement is to be expected in four and one-half months, but it seems fair to assume that a considerable part of this advancement is due to increased attention to drill.

It should be noticed that the scores in Test B are almost as high as those for the corresponding grades in Table 2. Now the number of cases in Test B is too small to allow any conclusions to be drawn. But these results at least suggest that the efficiency of the work in arithmetic in the rural schools would probably be greatly increased if more attention were given to drill.

COMMUNICATIONS AND DISCUSSIONS.

A CLASS EXPERIMENT IN ARITHMETIC.

(*Contributions from the University of Texas Educational Laboratory, No.* 5.)

During the Summer Session of 1914 the Courtis Standard Tests in Arithmetic, Series B, were given to a class of twenty-five college sophomores in the University of Texas. The class contained fifteen men and ten women, and the students varied in age from nineteen to thirty-five years. Fifteen in the class had had teaching experience varying from one to eight years. The results of the tests are shown in Table I.

The speed index was determined by dividing the number attempted by the total number of examples in each test and multiplying the result by 100. The accuracy index equals the number right times 100 divided by the number attempted. The efficiency index equals the speed index times the accuracy index divided by 100.

Inspection of the results shows that the tests of this series when given according to Mr. Courtis' directions are sufficiently difficult to constitute a real test for students of considerable maturity and advancement. Only three students finished any of the tests before time was called, and in each case the leisure time was only a matter of a few seconds. For purposes of comparison the median scores made by 20,441 Boston school children in February, 1914, are presented in Table II. The last line indicates the probable June standards for the eighth grade, estimated from the Boston, Detroit, and other investigations.

In a group that might be expected to be fairly homogeneous in respect to previous training, it is somewhat surprising to find such wide individual variations in the number attempted. In addition the score ranges from six to twenty-four, and in the other operations the variation is almost as great. An indication of this is found in the average speed index which varies from 26 to 85, while the mean variation in each of the operations is approximately 20 per cent. of the average. Nor are these individual differences limited to the number attempted. They are even greater for the number right,

TABLE I.—*Results of Tests.*

Student.	Attempted.				Right.				Speed Index.					Accuracy Index.					
	Addition.	Subtraction.	Multiplication.	Division.	Addition.	Subtraction.	Multiplication.	Division.	Addition.	Subtraction.	Multiplication.	Division.	Average.	Addition.	Subtraction.	Multiplication.	Division.	Average.	Efficiency Index.
A	11	22	13	17	6	14	10	17	45	90	52	71	65	55	64	77	100	74	48
B	13	16	10	14	11	15	8	14	54	67	40	58	55	85	94	80	100	90	50
C	8	13	6	6	5	10	4	6	33	54	24	25	34	63	77	67	100	77	26
D	13	16	10	9	9	15	10	4	54	67	40	37	50	69	94	100	44	77	39
E	12	12	9	8	8	12	8	8	50	50	36	33	42	67	100	89	100	89	37
F	17	14	14	10	14	10	12	9	71	58	56	42	57	82	72	86	90	83	47
G	15	16	11	16	11	12	9	15	62	67	44	67	60	73	75	82	94	81	49
H	16	24	20	22	11	22	13	18	67	100	80	92	85	69	92	65	82	77	65
I	13	24	17	17	11	21	15	15	54	100	68	71	73	85	88	88	88	87	64
J	14	13	11	14	13	11	10	12	58	54	44	58	54	93	85	91	86	89	48
K	12	17	13	14	11	16	11	13	50	71	52	58	58	92	94	85	93	91	53
L	12	20	12	12	11	15	11	11	50	83	48	50	58	92	75	92	92	88	51
M	19	16	14	19	18	15	13	18	79	67	56	79	70	95	94	93	95	94	66
N	6	7	6	7	4	6	4	6	25	28	24	28	26	67	86	67	86	77	20
O	24	23	14	20	21	20	11	20	100	96	56	83	84	88	87	79	100	89	74
P	14	19	11	12	9	12	6	9	58	79	44	50	58	64	63	55	75	64	37
Q	14	19	12	15	13	16	10	15	58	79	48	62	62	93	84	83	100	90	56
R	12	15	12	17	9	11	7	16	50	62	48	71	58	75	73	58	94	75	44
S	8	21	14	9	6	19	11	9	33	87	56	37	53	75	90	79	100	86	46
T	16	18	13	12	9	15	9	10	67	78	52	50	62	56	83	69	83	73	45
U	10	11	8	9	8	10	5	8	42	46	32	37	39	80	91	62	89	81	32
V	13	16	13	14	11	14	11	11	54	67	52	58	58	85	88	85	79	84	49
W	14	15	13	13	6	11	8	12	58	62	52	54	57	43	73	62	92	68	39
X	11	17	12	9	4	10	6	9	46	71	48	37	51	37	59	50	100	62	32
Y	14	13	10	9	10	11	9	8	58	54	40	37	47	71	85	90	89	84	39
Average	13	16.6	12	13	10	13.7	9.2	12	54	69	48	54	56	77	83	77	92	82	47
M. V.	2.5	3.2	2.2	3.5	2.9	3.1	2.2	3.6	10.3	13.5	8.6	14.6	9.3	12.7	8.9	11.4	7.7	7.0	9.5
M. V. in % of Av.	19	19	18	27	29	23	24	30	19	19	18	27	17	17	11	15	9	9	20

TABLE II.—*Median Scores of Boston Tests.*

	Attempted.				Right.			
	Add.	Sub.	Mul.	Div.	Add.	Sub.	Mul.	Div.
Grade 4.....	5.3	5.5	3.9	2.6	2.6	2.5	1.3	.7
" 5.....	7.2	7.6	5.8	4.5	3.7	4.9	3.3	2.0
" 6.....	8.3	9.0	6.9	5.8	4.9	6.3	4.8	3.3
" 7.....	9.2	10.0	8.0	7.6	5.6	6.9	5.1	5.1
" 8.....	11.0	11.4	9.5	9.2	7.8	8.6	6.5	6.9
Probable June Standards:								
Grade 8.....	12.0	12.5	11.5	10.5	8.0	10.0	8.0	9.0

as is shown by the fact that the mean variation is a uniformly higher per cent. of the average for the number right than for the number attempted. It would be interesting to know whether the same relations obtain with younger pupils. It is significant that division has an appreciably higher accuracy index (92) than any of the other operations, although it has also the highest variability both in number attempted and number right. It would seem that the cross multiplications and subtractions have a steadying rather than a confusing effect. Multiplication, on the other hand, makes a poor showing in both speed and accuracy.

TABLE III.—*Correlations.*

	Attempted.	Right.
Addition with Subtraction.....	.19	.37
Addition with Multiplication.....	.29	.47
Addition with Division.....	.42	.43
Subtraction with Multiplication.....	.51	.55
Subtraction with Division.....	.40	.37
Multiplication with Division.....	.49	.34
Addition attempted with Addition right.....		.55
Subtraction attempted with Subtraction right.....		.64
Multiplication attempted with Multiplication right.....		.60
Division attempted with Division right.....		.83
Addition Speed Index with Addition Accuracy Index.....		.11
Subtraction Speed Index with Subtraction Accuracy Index.....		—.17
Multiplication Speed Index with Multiplication Accuracy Index.....		.00
Division Speed Index with Division Accuracy Index.....		.09
Average Speed Index with Average Accuracy Index.....		.05

The correlations presented in Table III were computed according to the Spearman "foot-rule" formula $R = 1 - \frac{6 \Sigma g}{n^2 - 1}$. It is remarkable that the highest correlation both in number attempted and number right is found between subtraction and multiplication,—

processes which have the least in common,—while addition with subtraction and addition with multiplication stand relatively low, at least in the number attempted. The correlations for number right are higher than for number attempted, except in the case of subtraction with division and multiplication with division. On the whole these correlations, ranging as they do from .30 to .55, indicate that ability in fundamental operations is fairly general, that within broad limits the majority of individuals would hold nearly the same rank in all the operations, but that a considerable number show wide variations in one or more operations. It may be said in passing that these correlations agree in the main with those (unpublished) which the writer has obtained by the use of the Courtis Tests, Series A.

That the correlations between number attempted and number right should be high (.55 to .83) in all the operations was to be expected. Indeed, it is somewhat surprising that they are not even higher. The person who attempts only a few examples can have only a few right, while the one who attempts many has at least the chance of having many right. The high correlation in division is another indication of the greater accuracy in this operation. The correlations between the speed and accuracy indices, on the other hand, are remarkably low, and would indicate that there is no connection whatever between speed and relative accuracy in the fundamental operations.

Consideration of these results raises certain problems which call for further investigation. How reliable are the speed indices shown in Table I? Would they remain relatively constant or show a constant increment in five or twenty-five trials? The work of Otis and Davidson with eighth-grade children in addition makes such a conclusion doubtful. How reliable are the accuracy indices? It is somewhat disconcerting to find the average accuracy index so low (82) in students of this degree of maturity and specialization. Does this index fairly represent their present status in accuracy? If it does not, how can a reliable index of accuracy be found? When this has been ascertained we can inquire how accuracy in fundamental operations in arithmetic correlates with accuracy in other lines of mental activity, and finally to what extent accuracy is a general mental trait.

University of Texas. J. CARLETON BELL.

ABSTRACTS AND REVIEWS.

W. Franklin Jones. *Concrete Investigation of the Material of English Spelling.* Vermillion, S. D.: Published by the University of South Dakota, 1913. Pp. 27.

Into the 27 pages of this monograph are compressed the results of an extended investigation which should do much to help solve the troublesome problem of teaching spelling. In brief, the aim of the investigation was to determine the words used by children in the various grades of the elementary school (grades II to VIII, inclusive) in their own "free, written speech." From 1050 children distributed fairly uniformly through these grades, over 75,000 written themes were collected in such a way that the materials secured may be said to have exhausted the "word-wells" of the children. The investigation, in short, attempted to make a list of *all* the words that made up the writing-vocabularies of the 1050 children. The number of different themes that each pupil wrote before his word-well "ran dry" varied from 56 to 105, the pupils in the higher grades usually requiring both more themes and longer themes to exhaust their writing vocabularies.

The 75,000 themes represented a total of 15,000,000 words, *but the total number of different words* was only 4532, and these Dr. Jones prints in lists classified by grades. A most interesting table shows the number of new words added for each grade. What might be called the composite second-grade writing vocabulary comprises 1927 words; 469 additional words are found in the third grade; 442 in the fourth grade; 432 in the fifth grade; 425 in the sixth grade; 419 in the seventh grade, and 418 in the eighth grade. The *average* writing vocabulary of the second-grade pupil is 521 words; of the third-grade pupil, 908; the fourth-grade pupil, 1235; the fifth-grade pupil, 1489; the sixth-grade pupil, 1710; the seventh-grade pupil, 1926, and the eighth-grade pupil, 2135.

Practically every word in the list of 4532 was misspelled by one or more pupils; but the average number of misspelled words (for the 1050 pupils) was only 48, the extremes being 87 and 18. Some words, of course, were frequently misspelled, and the author gives a list of 100 which he terms the "spelling demons" of the English

language. The four words most frequently misspelled are *which, their, there* and *separate.* Other "demons" which every teacher will recognize as such are *business, friend, believe, piece, write, through, though* and *grammar.*

The author draws the following practical conclusions, among others, from his study: (1) The traditional spelling material is bad, because it comprises thousands of words which children do not use, and at the same time prevents teaching adequately the much smaller number of words that they do use. (2) The grading of spelling material is very inadequate. (3) The treatment of the "dangerous" spelling material is not efficient; the troublesome words are found, almost without exception, in the writing vocabularies of the lower grades, but these words are not effectively taught in these grades, and are consequently misspelled throughout school life. (4) The 20-words-a-day lesson in spelling should disappear, first, because spelling cannot be taught in doses so large as this, and secondly, because assignments that are so long imply more words than any student commands. (5) The most useful words in our language are the words learned early by children, hence the spelling vocabularies of the lower grades should receive special attention.

Dr. Jones's investigation is important, because of the light that it throws upon a troublesome problem of teaching; but it is also significant for another reason. It represents a type of work that, in our opinion, will characterize the development of educational science during the next decade—the determination of educational values upon an empirical basis. How to find out what educative materials are of fundamental and what are of accessory value is a difficult problem. Certainly, *a priori* judgment is not competent to the task. Dr. Jones has followed a "lead" in the determination of spelling values that is most promising. Work of a similar type is needed in connection with other school subjects—in arithmetic, geography, grammar and history. W. C. B.

BENJAMIN R. SIMPSON, Ph. D. *Correlations of Mental Abilities.* Teachers' College, Columbia University Contributions to Education, No. 53. New York City, 1912. Pp. 122. $1.00.

The time-worn apology "better late than never" must serve the reviewer for introducing now a resume of this very excellent con-

tribution to the literature of mental tests. Simpson's monograph appeared nearly two years ago, while the experimental work was done in 1907. It is, on many accounts, a great pity that publication was five years delayed.

Simpson selected fifteen tests, most of which have since become very familiar to those who have followed the work at Columbia, and proposed with their use to measure sense-discrimination, motor-control, perception, association, memory and selective thinking in two groups of subjects, so chosen as to represent the extremes of "general intelligence." The "good" group comprised seventeen professors and advanced students at Columbia, the "poor" group twenty adults of recognized inefficiency, who had never held positions demanding a high grade of intelligence.

The methods of administering and of scoring the tests are described in some detail, and then follow the results, so set forth that all the original scores are placed at the reader's command.

The author has had in mind three main problems: (1) Which tests best differentiate the good from the poor group? (2) Which tests show high and which low intercorrelations with one another? (3) Which tests correlate best with the imputed (estimated) rank-order of intelligence within the good group?

Speaking generally, the answer to the first problem is: The good is most sharply differentiated from the poor group by tests that demand abstract or selective thinking, less sharply by certain tests of memory, very distinctly by language tests demanding speed and accuracy in easy association, less decidedly by mechanical associations like adding, still less by tests of perception and motor-control and least of all by discrimination tests. It is unfortunate, in the reviewer's opinion, that the members of the good group were all of the same general type (academic men), particularly in view of the important rôle that is assigned to abstract thinking (of which the tests were entirely verbal) and to the other language tests as means of differentiation between high and low orders of intelligence. A third check group comprised of successful men of affairs would have made an interesting feature and have lent added cogency to the conclusions. Moreover, the motor tests, which gave little differentiation, were few in number and rather poorly chosen.

The answer to the second problem entailed laborious calculation of coefficients of correlation, with correction for attenuation according to Spearman's formulas. The original article must be consulted for details. Here it may be noted that Simpson uses his data to obtain a general justification of his classification of the abilities tested by the several tests and again concludes that the abilities significant of general mental ability are selective thinking, memory, simple association, perception, motor-control and discrimination, in the order mentioned—confirmation, in other words of the order in which the tests were found to be diagnostic in sorting out the two groups of subjects. The time spent in correcting raw coefficients by the Spearman formulas had much better be spent, Simpson concludes, in getting more accurate and reliable data.

The correlation between estimated intelligence and rank in tests (third main problem) revealed coefficients ranging from .07 to .96: Four tests proved specially valuable, viz: hard opposites (.96), easy opposites (.82), Ebbinghaus completion method (.89) and memory of words (.93).

The net conclusion, then, is that "general intelligence," as commonly understood, can be measured with a high degree of accuracy by the use of certain of the tests. In fact, an hour so spent in testing an individual gives us a very significant indication of his "general intelligence."

Simpson asserts that his data negative Spearman's theory of a hierarchy of factors underlying "general intelligence." This conclusion the reviewer is unable to accept, though space is wanting here to go further into this point.

The monograph closes with a comparison of results with those obtained by other investigators of general intelligence—Wissler, Terman, Binet, Spearman and Kruger, Burt, Bonser and others, and the appendix describes briefly the fifteen tests.

The present writer has found the instructions for administering the tests obscure or silent on a few points, but, in general, the manner in which this work has been assembled is much superior to the common run of experimental theses and sets a high standard of excellence. It strengthens very materially the confidence that we feel in the reliability and serviceability of objective tests of intelligence.

G. M. W.

LEWIS M. TERMAN. *The Hygiene of the School Child.* Boston: Houghton Mifflin Company, 1914. Pp. xvii, 417. $1.65 net.

There is now no excuse for the prevalent ignorance regarding school hygiene. The subject has become too extensive for discussion in a single volume, but recent books on different phases have made easily available the best principles so far reached. The present book by the author of that helpful monograph on the "Teacher's Health," is limited mainly to the diagnosis and prognosis of developmental defects, with advice as to treatment in home and school. This limitation has the disadvantage for the teacher of necessitating the purchase of other books on school hygiene, but it has the advantage of allowing space for adequate discussion of the topics included. The author summarizes, with unusual clearness and interest, the results of European and American studies. His scholarship and practical suggestions make this the most serviceable book in its limited field for teachers and parents.

Special features of arrangement are the tables of data, the charts, figures, etc., the alphabetical and numerical list of references at the end of each chapter, with an asterisk before the most useful books or articles; the consequent ease of cross-reference; the sub-titles and summaries of chapters; the list of nineteen books for a teacher's private library, and the glossary of technical words. For popular use two more such aids might have been added—a key to the abbreviated magazine titles and a reference table of English equivalents of the metric system. Of greatest service are the diagnostic tables of skeletal defects, malnutrition, dental defects, nasal obstructions, deafness, eye-strain, nervousness, speech defects and types of children likely to be injured by school strain. The binding and type (except for references) are attractive, but the paper is not as good as that of Cubberley's book in the same series and, in the copy reviewed, allows the print to show through from one side of a sheet to the other.

A noteworthy feature of such a book for popular study is its cosmopolitanism, European references being given proportionately greater emphasis on acount of their scope and value. This international spirit will broaden the teacher's outlook and make her realize the similarity of children and educational problems in all civilized countries. (Terman has neglected, however, to use two French and one English journal on his subject.)

After two introductory chapters on the value of hygiene, the author well devotes fifty pages to growth. A serious defect is the insufficient discussion of pubertal development and hygiene, because here was just the opportunity to give teachers the correct knowledge and attitude toward this subject. The clear presentation of the studies of physiological age is marred by a prudish omission of the basis of Crampton's classification. No mention is made of Weissenberg's "Das Wachstum des Menschen," or the British Association's "Report on Anthropometric Method," and the teacher is not guided in making or interpreting measurements.

The chapters on physical defects reveal a layman's fine insight into physiological and medical knowledge. Terman has used suggestions of medical friends, to whom acknowledgment is given, but the book throughout is the work of an educationist who considers development more than prevention and prevention more than cure. As some of the percentages of defects seem high for American schools, there is reason to doubt whether European data can be generalized for America without more discount. The references and tables show a significant disregard of American data from routine medical inspection as being superficial for scientific purposes.

Tuberculosis is the only zymotic disease fully discussed on account of its influence on development. The opinion that half of our schoolchildren have the disease in latent or active form may be due to a probable over-emphasis upon the diagnostic value of the tuberculin test with children. The chapter on the Physiology of Ventilation is a forceful argument for the view that "air currents, temperature and humidity are the important factors in ventilation, producing their effects chiefly through their influence on the heat-regulating mechanism." This view should call forth important suggestions in regard to the hygiene of clothing and bedding. The chapter on the Education of Nervous Children is a masterpiece. The last two chapters are reprints of articles on Sleep and on European studies of unhygienic influences of school life. Although the final conclusions involve the danger in applying European results to easier American school conditions, they may well "give us pause." It is to be hoped that Terman's companion volume on the "Hygiene of Instruction" will include discussions of fatigue, play and gymnastics, sex instruction, and the teaching of hygiene, which are treated only in part in the first volume.

This book should have a wide sale in schools, teachers' reading circles, and women's clubs. It could well be used in connection with the chapters on other phases in Dresslar's "School Hygiene." The discusion of vital problems in both books cannot fail to provoke thought and action for the public good.

University of Virginia. W. H. Heck.

S. W. Newmayer, A. B., M. D. *Medical and Sanitary Inspection of Schools.* Philadelphia: Lea and Febiger, 1913. Pp. vii, 318.

There is little doubt that medical inspection of schools has come to stay. The great questions now confronting us are how can medical inspection be made most effective and what are the results that may legitimately be expected from it? The present work makes no pretensions to scientific completeness, but is written out of the fulness of twelve years' practical experience in the medical inspection of school children. The author is now in charge of the division of child hygiene, Philadelphia Bureau of Health.

A brief introductory chapter outlines the history of medical inspection and indicates the objects of the work. These include (1) the detection of contagious diseases, (2) the detection of physical defects, (3) the discovery of the capacity of the individual pupil to acquire knowledge, (4) the attainment of the best possible hygienic surroundings for the school child, (5) closer relationship between the school and the home, and (6) the inculcation of practical hygiene and healthful living. Many of these belong obviously to a program for the future, and as actual medical inspection has been limited almost exclusively to the first two it is natural that the greater part of the book should be devoted to their consideration. It must be said, however, that more space is given to the third point, in the sense of examination for mental defects (52 pages) than is to be found in any other single volume on medical inspection or school hygiene.

Part I deals with the administration of inspection, indicates the organization of inspection in various states and cities, sets forth the qualifications of inspectors, and discusses bureaus of child hygiene, systems of inspection, school nurses and methods of recording and using the data noted by inspectors. The question as to whether medical inspection should be under the control of the board of health or the board of education is touched upon but not

adequately discussed. In New York City it is controlled by the board of health, with the result that the co-operation between the inspectors and the teachers leaves much to be desired. In Philadelphia the board of education has control, and can therefore see that teachers, principals and inspectors work together for the welfare of the pupils. The supreme importance and value of the school nurse receive due emphasis, but dependence upon school nurses alone is branded as a short-sighted and dangerous policy.

In Part II, the inspection of school buildings and grounds, the author takes the important step of making the school inspectors responsible for the enforcement of fundamental hygienic regulations regarding toilets, drinking fountains, lighting, heating, ventilation, cleanliness, and the adjustment of school furniture. This is obviously outside the jurisdiction of the board of health, and could be efficiently administered only by officers of the board of education.

Part III contains the usual directions for the diagnosis of contagious diseases, and Part IV treats of physical and mental defects, including defects of the eyes, ears, nose and throat, teeth, skin diseases, and mental retardation. The author rightly points out that hyperopia and astigmatism are much more frequent and more serious eye defects than the widely trumpeted myopia, and he is undoubtedly justified in his skepticism of the value of the ordinary visual test cards. The discussion of oral inspection and hygiene is admirable in its completeness and thoroughness. It is safe to assume that much more attention will be given to the care of the mouth if such inspection becomes a routine procedure. The section on mental deficiency gives a very full account of the Binet scale and the results of its use by Goddard. This is at least a first step on the road to the "discovery of the capacity of the individual pupil to acquire knowledge,"—a problem the solution of which should be the first and most insistent duty of the teacher rather than of the medical inspector.

The book is a useful contribution to the literature of educational administration, and should convince anyone who reads it that not every M. D. is *ipso facto* prepared to act as medical inspector of schools, but that the position requires careful and special training if the inspector is to render efficient service to the community.

J. C. B.

THE
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EDITORIAL.

PREPARATION OF THE HIGH SCHOOL TEACHER.

It is doubtless true, as sometimes asserted by college professors, that anybody with common sense and a knowledge of his subject can teach in a high school. Further questions are how efficiently can he teach and what constitutes a knowledge of his subject? To adequately answer these questions we need more accurate measures of the results of teaching, and more careful studies of the characteristics of the successful teacher as contrasted with the unsuccessful or the mediocre one. A frequent charge made against the high school teacher is lack of scholarship, and there is little doubt that compared with the German *Gymnasiallehrer,* with his extended graduate training and his Ph. D. degree, the American teacher's showing in pure scholarship is rather pitiful. Accordingly, we find school authorities insisting more rigorously upon the bachelor's degree, and in many quarters candidates with the master's or the doctor's degree are given the preference. In so far as this improves the quality of the teaching or

increases the prestige of the high school teacher in the eyes of the community, it is to be commended. But are we not in danger of laying stress on the *amount* of scholarship rather than on its kind or its significance for the purpose in hand? In academic circles the assumption goes unchallenged that the more a person knows about his subject, and especially about the higher and more technical phases of it, the better he will be able to teach it. Hence prospective high school teachers are urged to prepare themselves by taking more and higher courses in the subject they are to teach. But is this justified? Of what advantage will courses in analytical geometry, calculus and mathematical theory be to the teacher of high school algebra and geometry? What will an intensive study of the Punic wars or of the English Restoration profit the high school history teacher? To what extent will courses in early English or in the analysis of the Elizabethian drama increase the efficiency of the high school teacher of English? Indeed, it is an open question whether these advanced studies are not worse than useless, whether they do not set up standards of attainment and establih habits of work that are positively harmful to the high school teacher, and that require months and sometimes years of painful effort to eradicate. At the same time the actual command of the knowledge which the teacher needs in English and history and mathematics is uncertain, and the ignorance of the resources available for high school teaching is profound. Moreover, how few high school teachers know anything about economics, commercial geography, industrial organization, sociology, institutional history, ethics, and other subjects which are of value in interpreting the culture of the past and the present to the eager young minds that are athirst for the big things of life!

Truly we need a broader and more comprehensive scholarship in our high schools, but it should be a scholarship that has some bearing upon the situations that the high school teacher will meet. It should be a scholarship that has its center in the interests and activities of adolescent boys and girls, and its constituent elements should be those phases of human knowledge that will contribute most liberally to the wise guidance of their mental development. But this standard of scholarship will call for a complete reorganization of the college courses which are currently recommended for the preparation of high school teachers. J. C. B.

NOTES AND NEWS.

The board of education of Oakland, California, announces the opening of a university school under the supervision of the University of California. The school will be conducted after the plan of the Horace Mann School of New York, and will ultimately offer a six-year college preparatory course, accepting pupils from the sixth year of the elementary school. Classes will be organized for the present only in the seventh, eighth, ninth and tenth grades. Through the co-operation of practice teachers from the University it will be possible to keep the classes small,—about fifteen pupils in each class. Instruction will be offered in each of the leading modern languages, and they may be begun early in the course. The school will be open for work from 8 a. m. to 5 p. m., and will thus afford opportunities for pupils who are behind to catch up in their work, or for those who so desire to take extra work. Special emphasis will be placed on music and athletics, and the assembly exercises will be so planned as to give a series of presentations of the world's work, the world's culture, etc. The school will serve on the one hand as a model secondary school for the state, and on the other as a practice and experimental school for the department of education of the University. It will be under the direction of Professor C. E. Rugh of the University of California.

At the spring meeting of the General Education Board an appropriation of $20,000 was made for farm demonstration work in six counties in the State of Maine and $10,000 for similar work in the State of New Hampshire. This includes the organization of boys' and girls' clubs along the lines so successfully inaugurated in the South by Dr. Seaman A. Knapp. To further the solution of the rural school problem the Board appropriated $50,000 for the support of special officers in a number of states, whose duty it shall be to study rural school conditions and to devote themselves continuously to the task of developing adequate laws, adequate organization,

proper support and proper facilities for rural schools. In view of the lack of schools for the training of public health officers the Board authorized a study of the public health service in this country and Europe with the purpose of determining the most desirable preparation for that service and of formulating a scheme for the establishment of schools to provide this preparation.

The School of Education of the University of Pittsburgh has started a campaign to secure funds for the erection of an education building to contain administration and class rooms, laboratories, library, assembly room, etc.; a complete training and demonstration school building to accommodate all grades from kindergarten through the high school; smaller buildings to house the special departments of Household Economy, Music, and Fine and Industrial Arts; and an endowment of $500,000 for maintenance.

The National Association for the Study and Education of Exceptional Children, of Plainfield, N. J., announces a nine-months' training course (October-June) for teachers wishing to prepare themselves for special work with exceptional children. The course will be conducted in its institution at "Watchung Crest," Plainfield, N. J., and will include a comprehensive program of lectures, research work, and practical teaching and supervision of a selected group of children. A limited number of scholarships carrying free tuition and living expenses are available.

The Fourth International Congress for Popular Education and Culture, which was to have convened at Leipzig, September 25-29, has been postponed on account of the war.

The Annual Swarthmore Conference of Teachers was held at Swarthmore College, April 25, 1914. Dr. Calvin N. Kendall, Commissioner of Education of New Jersey, spoke on "The Profession of Teaching"; Dr. Kate Gordon of Bryn Mawr College discussed "Method in Education," and Dr. Bird T. Baldwin of Swarthmore College considered "The Science of Experimental Education," with type demonstrations.

The division of reference and research of the department of education, New York City, has recently issued a Teachers' Year Book

of Educational Investigations, containing selected annotated bibliographies on the value and use of standards of measurement, tests and units of measurement in special school subjects, general intelligence tests, and educational administration. The bibliographies were compiled by Dr. Isidore Springer.

During the last few months of the school year the Department of Co-operative Research of the Courtis Standard Tests made a special effort to secure a "nation-wide measurement of the results of the year's work in arithmetic" as indicated by the showing made with the new Series B tests in arithmetic. The tabulation of these results should yield valuable standards of accomplishment in the fundamentals of arithmetic.

Dr. David Spence Hill, Director of the Department of Educational Research, New Orleans, has recently made a report of almost 400 pages on the care of delinquent children in New Orleans. The report presents a discussion of typical methods of dealing with delinquents based on personal visits to cities and institutions throughout the country, an analysis of local conditions in New Orleans, and a psychological and sociological study of sixty-three boys now confined in the Waif's Home. Dr. Hill recommends (1) the establishment of a home for the temporary detention of children sent to the Juvenile Court, where they may be properly cared for until their cases are disposed of; (2) a parental residential school for incorrigible or delinquent boys, constructed on the cottage plan; (3) a boys' special school, to be used as a day school for truants; and (4) the establishment of a New Orleans Board of Children's Guardians to have charge of the inspection and supervision of children in institutions, and to develop the placing-out system by co-operation with pastors and social-workers.

Dr. Guy Montrose Whipple, assistant profesor of educational psychology, Cornell University, has been appointed associate professor of education at the University of Illinois. Dr. Whipple will give courses on educational psychology, experimental pedagogy, the education of exceptional children, and educational classics, and will devote his attention particularly to the development of mental tests.

CURRENT PERIODICALS.

JOURNAL OF EXPERIMENTAL PEDAGOGY. Vol. II, No. 3, December, 1913. E. ALLISON PEERS. *Imagery in Imaginative Literature.* 174-187, 261-280. Five groups of six boys each, ranging in age from thirteen to seventeen years, were tested for the nature of their imagery, for the effect of imagery upon the understanding of a piece of literature, and for the control of imagery by the teacher. Vivid imagery may be of great value in apprehending literature if the meaning is carried by the imagery. In most cases, however, vivid imagery is apt to be a hindrance rather than a help in the interpretation of literature, and has to be positively rejected by the pupil. The teacher, therefore, is scarcely justified in endeavoring to arouse vivid imagery. The study is a valuable and practical one.

W. VICKERS and STANLEY WYATT. *Grading by Mental Tests.* 187-197. Can pupils who present themselves at one school for entrance from another school be satisfactorily graded solely on the results of mental tests? Three tests, analogies, sentence completion and opposites, were applied to seventy-eight children from nine to fifteen years of age. The co-efficients of reliability were high, ranging from .60 to .91. Opposites and sentence completion are slightly more reliable than analogies. The more difficult tests give higher correlations with intelligence classifications than do the easier ones.

No. 4, March, 1914. E. J. G. BRADFORD. *The Coloring of School Maps.* 283-292. School maps show wide differences in coloring. Are there any combinations of colors that will produce relief effects? As the result of various experiments with twelve boys the author concludes that the less luminous the color the nearer it appears to be. This is scarcely in accord with the further statement that red stands out most and the relief effected decreases in spectral order from red to violet. The following color scheme is suggested for maps: Greenish-yellow for the lowest land, then orange-yellow, light brownish-crimson to deep crimson-brown for the highest.

STANLEY WYATT. *The Interrelation of Memory Performances.* 292-298. To what extent is memory ability general? What is the correlation between different types of memory in the same individual? The immediate memories of thirty-eight children of both sexes, ranging from ten to twelve years, were tested with nonsense syllables, concrete terms, digits and narrative. The evidence is against any general memory faculty. The highest correlation is between nonsense syllables and concrete terms, the lowest between narrative and digits.

MABEL HASSALL and LILIAN VARLEY. *A Reading Test.* 298-301. A comparison of the reading efficiency of 145 children of the same grade in two different schools, and a study of their reading rates and their mistakes. In school A the sentence method of teaching reading was used, while in school B no particular method was adhered to, but stress was laid on comprehension of meaning and on phonic analysis. The latter school made the better showing. Word readers are much speedier than "spellers."

No. 5, June, 1914. W. H. WINCH. *Should Young Children Be Taught Arithmetical Proportion? Part II.* 320-330. Standard I

and II boys (7 years 5 months to 8 years 8 months) were found to be too immature to do good work in this line. It should be postponed until about 9 years. This is contrary to the results reported in Part I, where it was shown that some Standard I children could do the work satisfactorily. All depends on the relative improveability of the pupil.

I. LAWRENCE. *Children's Humor.* 330-334. An analysis and tabulation of 200 papers from school children on the funniest thing they had heard, read, or experienced.

W. H. A. DOCKERILL and A. J. FANNINGS. *A New Test of Reasoning.* 356-361. Ten familiar proverbs were given the class, and each pupil was asked to give the best illustration of each proverb that he could think of, and to express its real meaning in ordinary language. The results show high correlation with examination marks and with teachers' estimates.

HARRY G. STEAD. *Spelling Errors in Children.* 362-364. A tabulation of children's mistakes in spelling according to Rusk's classification into errors due to defective capacity for expresion and those due to faulty apprehension. Attempts at phonetic spelling seem to be responsible for the largest number of errors.

SCHOOL SCIENCE AND MATHEMATICS. Vol. XIII, No. 9, December, 1913. GEORGE C. WOOD. *Biology from the Pupil's Standpoint.* 804-814. The results of a questionnaire answered by 538 high school pupils who had just completed their first course in biology. The pupils were asked to arrange certain topics in order of interest and of practical importance. There is a greater interest in function and activity than in structure and classification.

Vol. XIV, No. 1, January, 1914. CLARENCE W. HAHN. *Sex Education for School Children.* 54-63. Advocates an approach to the discussion of human sex relations through a general course in the biology of reproduction.

No. 4, April, 1914. FLORIAN CAJORI. *A New Marking System and Means of Measuring Mathematical Abilities.* 283-293. The author refers to the Binet-Simon tests and to the demand for similar measurements in secondary mathematics, but doubts the practicability of such tests in the high school. He advocates a preliminary "array" of pupils according to memory tests, original exercises, and diligence in class work, and on the basis of these values an assignment of each pupil to a place on an abstract scale constructed according to the normal frequency curve. A five-group system based on the amount of deviation from the mode would seem to be the most convenient method of recording standing.

No. 5, May, 1914. D. W. WERREMEYER. *Reliability of Grades of Test Papers in Mathematics.* 422-429. Five test papers in geometry, representing the work of the best, the medium, and the poorest pupils in the class, were graded on a scale of 100 by each of six teachers. The range of deviation was from 11 to 41, and the mean variation was from 2.5 to 9.8. Similar deviations were found with algebra

and arithmetic papers. An interesting table shows the results of regrading a set of algebra papers after an interval of seven months.

EDWIN C. DODSON. *A Study of Student Achievement in Mathematics.* 430-435. A plea for a more definite scale of measurement to indicate the quality of a pupil's work. The author presents a statistical study of the marks given by ten instructors in mathematics in a large high school. The percentage of failure in elementary algebra and geometry varies from 24 to 34. Is this percentage too large? To answer this question we must have more objective standards of measurement.

PSYCHOLOGICAL CLINIC. Vol. VII, No. 8, January, 1914. IRVING KING. *Physiological Age and School Standing.* 222-229. A study of the incidence of physiological maturity in relation to proficiency in school tasks and to progress through the grades. Two hundred and seventy-one grammar school pupils from ten and one-half to sixteen and one-half years in classes 6B to 8A were ranked with reference to their maturity and their school grades. Early maturity seems correlated with high standing.

No. 9, February, 1914. ARTHUR DERMONT BUSH. *Binet-Simon Tests of a Thirty-nine Months Old Child.* 250-257. A detailed account of the application of the tests to a single individual. The child showed a mental age of six years.

WILLIAM H. HECK. *A Third Study of Mental Fatigue in Relation to the Daily School Program.* 258-260. (See this JOURNAL, Vol V, No. 2, February, 1914, 92-95.)

Vol. VIII, No. 1, March, 1914. LIGHTNER WITMER. *The Montessori Method.* 1-5. Praises Madam Montessori as the first to put into practice a type of training that others have only talked about. Emphasizes the good points in the method.

HARRIET SAYRE. *The Artistic Value of the Montessori Geometrical Insets.* 6-11. The insets afforded material for a series of 500 drawings without the aid or suggestion of the teacher. The stimulus which they give to artistic combinations is highly educative.

CLAIBORNE CATLIN. *Incorrigibility Due to Mismanagement and Misunderstanding.* 12-24. A study of an exceptionally brilliant child who through carelessness and neglect had become so uncontrollable as to produce the impression that she was insane.

No. 2, April, 1914. ELIZABETH E. FARRELL. *A Study of the School Inquiry Report on Ungraded Classes.* 29-47, 57-74, 99-106. A detailed, critical examination of Dr. Goddard's report on ungraded classes in New York City. In general the attitude of the writer toward the report is hostile, and this hostility colors and distorts the discussion of even those points of the report with which the writer might be expected to be in agreement.

A. W. TRETTEIN. *The Exceptional Child in School.* 48-51. A study of an individual backward boy shows that the ordinary classroom not only does the backward pupil no good, but trains him in positively vicious habits of thinking.

No. 3, May, 1914. HILDA VOLKMOR and ISABEL NOBLE. *Retardation as Indicated by One Hundred City School Reports.* 75-81. A study in city school reports for the years 1904-1912 to determine to what extent studies in retardation have affected the work of the schools. The years 1909-1911 show the greatest activity of school superintendents in this field. In 1912 there is a marked drop in interest.

PHILIP A. BOYER. *Class Size and School Progress.* 82-90. Classes in the Philadelphia schools were divided according to size into six groups. The largest group had from 40 to 44 pupils in each class. There would seem to be little connection between size of class and percentage of promotions.

No. 4, June, 1914. MARGARET OTIS. *The Problem of Life from a Girl's Point of View.* 93-98. A graphic account of an attempt to get a girl started in the right way, and of the reasons for its failure.

HORACE RICHARDS BARNES. *The Further History of Some Troublesome Boys.* 107-113. A follow-up study of the boys described in the *Psychological Clinic* for November 15, 1910. These boys were all "incorrigibles," yet most of them are now living normal, useful lives.

ELEMENTARY SCHOOL TEACHER. Vol. XIV, No. 1, September, 1913. C. L. PHELPS. *A Study of Errors in Tests of Adding Ability.* 29-39. This is a tabulation of the errors made by pupils in the Courtis addition tests previously reported by Otis and Davidson. In 5950 tests 5388 errors were found. The largest number of errors was found in the following combinations: $7+9$, 395; $5+8$, 369; $6+9$, 320; $3+9$, 304; $5+9$, 298; $4+7$, 232; $3+8$, 231. The slowest group did the most accurate work and the fastest group made the most errors.

No. 2, October, 1913. HELEN T. WOOLLEY. *Facts About the Working Children of Cincinnati and Their Bearing Upon Educational Problems.* 59-72, 132-139. A classification of the children leaving school to go to work, showing the type and location of schools from which they come, the children's age, sex, school grade, occupation, and wages, and the bearing of these conditions upon educational policies. The author pleads for more training in manual dexterity in the scohols.

No. 4, December, 1913. FRANK N. FREEMAN. *Some Practical Studies of Handwriting.* 167-179. A tabulation of all available data with reference to the relation between speed and quality of handwriting. Tentative standards are set up and the need for further investigation is emphasized.

W. C. REAVIS. *The Interests of Children of the Primary and Intermediate Grades in the Use of Color.* 180-186. Red is decidedly the preferred color, followed at some distance by blue. When primary children were given outlines of birds to color, they massed the colors without regard to the exact representation of the colors of the bird in nature. The intermediate grades showed greater regard for faithful representation, but less freedom in drawing.

No. 5, January, 1914. LEWIS ATHERTON. *Literary Selections Most Frequently Memorized in the Elementary School.* 208-220. A statistical tabulation of the selections recommended for memorizing in thirty-four courses of study.

No. 6, February, 1914. EVERETT EVELETH CAMPBELL. *A Study of Retardation and Class Standing on the Basis of the Home Language Used by Pupils.* 264-282, 331-347. An elaborate investigation of the school records of 3000 Chicago pupils with reference to the language used in the home. The author concludes that the language factor is not of sufficient importance to be considered as one of the causes of retardation, or as determining the relative class standing.

V. A. C. HENMON. *Retardation, Acceleration and Class Standing.* 283-294. A study of over 2000 elementary pupils in the schools of Madison, Wisconsin. Age-retardation statistics give no satisfactory evidence of mental or pedagogical retardation. Retarded, normal, and accelerated pupils show only slight differences in class standing.

No. 7, March, 1914. J. MACE ANDRESS. *The Teaching of Hygiene Below the High School.* 325-330, 393-399. An examination of instruction in hygiene in elementary schools, and a plea for better trained teachers, better text books, and greater insistence upon the formation of right habits.

No. 8, April, 1914. CHARLES H. JUDD. *Reading Tests.* 365-373. Discusses the need for standard tests in reading and submits a selection to serve as test material for ability to get the meaning of a passage by silent reading.

S. A. COURTIS. *Standard Tests in English.* 374-392. A description of the new Courtis tests in English, and a series of curves to show the rating of each grade in the various tests. No data are given to indicate how these curves were obtained.

No. 10, June, 1914. WALTER A. JESSUP. *Economy of Time in Arithmetic.* 461-476. A tabulation of the results of a questionnaire to school superintendents on the elimination of certain topics in the teaching of arithmetic. There is a tendency to omit the less practical topics, and to concentrate on drill in fundamentals. There are wide variations in time allottment, and experimental studies are urged to determine the nature of the results under these varying conditions.

H. A. BROWN. *The Measurement of the Efficiency of Instruction in Reading.* 477-490. A plan for the measurement of pupils' efficiency in silent reading. The author takes account of rate of reading, quantity of reproduction, and quality of reproduction. The results of these three measurements are reduced to standard units of reading efficiency by multiplying the number representing the rate by the average of the numbers representing the quantity and the quality of the reproduction. The ratings of the third and sixth grades in seven schools are presented, and the author analyzes the factors entering into the teaching of reading.

PUBLICATIONS RECEIVED.

(Notice in this section does not preclude a more extended review.)

DAVID ALLEN ANDERSON. *The School System of Norway.* Boston: Richard G. Badger, 1914. Pp. 232. $1.25 net.

A descriptive treatment of a contemporary school system which affords opportunity for comparative study not enjoyed heretofore. The work treats of the rise, development and present tendencies of Norway's educational activities.

A. E. BRIDGER. *Minds in Distress.* Boston: John W. Luce & Co., 1914. Pp. xi, 181. $1.25 net.

The author calls this "a psychological study of the masculine and feminine mind in health and in disorder." But let it not be thought that he means by this the mind of males or the mind of females. Rather these are "types," and each type includes representatives of both sexes. The author seems to have in mind a contrast between a reasoning, reflective type of mind and an intuitive, impulsive type. He thinks that neurasthenia is the predominating disorder of the one and hysteria of the other. Whether such pronounced types exist outside of the author's imagination is another question.

PERCIVAL R. COLE. *Industrial Education in the Elementary School.* Riverside Educational Monographs. Boston: Houghton Mifflin Co., 1914. Pp. xiv, 64. Thirty-five cents.

The problem of industrial education is attacked from the historical and psychological points of view, and the author shows that it is imperative to reconstruct not only the curriculum, but also school methods. In connection with the latter point the author lays especial emphasis on excursions, manual work, oral expression, supervised study, and following the development of primitive industries.

W. A. COOK AND M. V. O'SHEA. *The Child and His Spelling.* Childhood and Youth Series. Indianapolis: The Bobbs-Merrill Company, 1914. Pp. 282. $1.00 net.

The sub-title of this interesting book is "an investigation of the psychology of spelling, individual and sex differences in spelling abilities and needs, the character and range of the spelling vocabulary, and the practical problems of teaching spelling." In Part I

the authors describe experiments on the value of rules in spelling, and conclude that the learning of spelling rules has no practical significance; they give a very instructive account of the life history of certain spellings; column spelling is deplored, and contextual use of words to be spelled is earnestly advised. In Part II we find the results of an elaborate statistical study of the words actually used by educated people in correspondence, with the conclusion that one-half to two-thirds of the words in the ordinary spellers would never be employed in the ordinary writing vocabulary of the child. The book is written in a simple, popular style, and will be of value to teachers and parents alike.

S. A. COURTIS. *Manual of Instruction for Giving and Scoring the Courtis Standard Tests.* Detroit, Mich.: Department of Co-operative Research, Courtis Standard Tests, 1914. Pp. 128.

From the small thin pamphlet of 1910 this manual has grown to the present stately volume of 128 folio pages. The title does not exactly indicate the scope of the work. It is not only a manual of instruction, but presents all of the tests in their actual size, the various record sheets, graphs, etc., which facilitate the use of the tests, and comparative and standard scores derived from applications of the tests in Detroit, New York, Boston, and other cities. The manual includes not only Series A, the original tests in arithmetic, but Series B, the new tests in fundamental operations issued last fall, and Series C, the tests in English. It puts the whole matter of the Courtis tests in convenient form for reference, and will undoubtedly be in great demand.

HENRY DAVIES. *Art in Education and Life.* Columbus, Ohio: R. G. Adams & Co., 1914. Pp. xiii, 334.

In attempting to give college courses in aesthetics the author has been impressed by the lack of background in taste and appreciation that should have been provided in the elementary and secondary schools. To call the attention of the public to these defects and to suggest remedies for them is the object of the present book. Of especial interest are chapters III, the aesthetic resources of the schools, and IV, methods of developing taste.

WILLIAM STEARNS DAVIS. *A History of Mediaeval and Modern Europe.* Boston: Houghton, Mifflin Company, 1914. Pp. xv, 560, xxviii. $1.50.

The stirring contemporary events in Europe make it easy for teachers to develop modern European history in a vital and effective manner. The present text will prove a valuable adjunct to the teacher's efforts on account of the simplicity and directness of its

style, the number and quality of the illustrations, and the excellence of its mechanical construction.

GEORGE VAN NESS DEARBORN. *What a Student of Elementary Psychology Should Be Taught Concerning the Functions of the Nervous System.* Reprinted from the Journal für Psychologie und Neurologie, Vol. 21, 1914. Pp. 35-44.

An abstract of this article will be found in this JOURNAL, Vol. IV, p. 175.

GEORGES DEMENY. *L'education de l'effort.* Paris: Librarie Felix Alcan, 1914. Pp. viii, 228. Fr. 2.50.

The author is professor of physical education in the city of Paris, and has written a large number of books on physical education, the development and control of movement, gymnastic dances, violin playing, the physiology of art, etc. In the present work he discusses the physiology and psychology of effort, the results upon thought and feeling of well-directed effort, and the education of effort. While the work reveals no knowledge of modern psychology, the author's reasoning is sound and wholesome, and his emphasis upon the value of controlled effort accords with the gospel of work now preached by the nerve specialists.

MABEL IRENE EMERSON. *The Evolution of the Educational Ideal.* Boston: Houghton Mifflin Company, 1914. Pp. xi, 185. $1.00 net.

A sketch of the history of educational development and progress designed for teachers-in-training, teachers in service, and teachers' reading circles. Such bird's-eye views may have some value, but a thorough understanding and mastery of a given period is superior both in cultural and professional aspects. It is an open question whether teachers should be encouraged to spend their time on such brief glimpses of large and complicated educational movements. They not only fail to get a true conception of educational ideals, but they obtain positively false and distorted notions of cultural development.

ROY K. FLANAGAN. *Sanitary Survey of the Schools of Orange, Virginia.* Bulletin No. 590. Washington: Bureau of Education, 1914. Pp. 28.

The results of this survey bring us face to face with the problem of medical inspection in rural schools. The official inspector must be supported and supplemented by a "district visitor," who will pick out those pupils that need more careful examination, and who will see that the recommendations of the inspector are carried out.

W. T. Foster, Editor. *The Social Emergency. Studies in Sex Hygiene and Morals.* Boston: Houghton Mifflin Co., 1914. Pp. viii, 224. $1.35 net.

"This volume is the outgrowth of an extension course conducted by Reed College in Portland, Oregon, in 1913. The course was offered to teachers and to workers in other fields of social service as an outline of the main problems of social hygiene and morals and as a guide to further study. The chapters are the various lectures, condensed by the editor, but otherwise substantially as given." There is an introduction by Ex-President Eliot, a statement of the problem by the editor, and a consideration of it by the various speakers from the physiological, medical, economic, recreational, educational, instructional, moral, and religious aspects. There is a fairly complete, classified bibliography of 16 pages.

Ernest Bryant Hoag and Lewis M. Terman. *Health Work in the Schools.* Boston: Houghton Mifflin Company, 1914. Pp. xiv, 321. $1.60 net.

With the increasing recognition of the duty of education to include the supervision of physical as well as mental development, and with the growth of public interest in health inspection and supervision, the need for guidance in health matters becomes manifest. Both the authors of this book are well-known hygienists, and have had extended practical experience in the field of which they write. This raises the expectation that what they have to say will be both dependable and workable, and inspection of the volume amply confirms this assumption. The discussion includes a general survey of health supervision, the functions of the school nurse, the health grading of school children by teachers, demonstration clinics for the instruction of teachers in the observation of defects, medical and dental clinics, transmissible diseases, open-air schools, professional training for janitors, the teaching of hygiene, sex education, the teacher's health, and a glimpse at what other countries are doing for the health of their school children.

Horace A. Hollister. *The Administration of Education in a Democracy.* New York: Charles Scribner's Sons, 1914. Pp. xv, 383.

This book is an attempt to deal with the field of educational administration as an organic whole viewed from the standpoint of the ideals of democracy. Part I is introductory and develops the field and scope of the treatment from the historical point of view. Part II considers society's share in the administration of education, and discusses the legal aspects of school organization, the functions and duties of school boards, the preparation and selection of teachers, and the physical equipment of schools. Part III deals with the

administration of instruction, including supervision, school inspection, attendance, physical education, the curricula, classification and promotion, and the relation between public and private education.

GEORG KERSCHENSTEINER. *The Schools and the Nation.* New York: The Macmillan Company, 1914. Pp. xxiv, 351. $1.60.

Students of the movement for vocational and industrial education in this country are well aware of the extent to which we are indebted to the broad and comprehensive ideas of the Munich Director of Education, and it is a satisfaction to have his "Fundamental Questions of School Organization" made accessible to English readers. The dominant aims of the author are to make the schools effective instruments in the cause of civic education, and to secure adequate provision for the continued training of boys and girls between the ages of fourteen and eighteen,—"for that part of the population which earns its daily bread through the practical work of commerce, handwork, industry, or agriculture." An interesting chapter is the one on the training of teachers, which presents an entirely new view of the traditional training in Germany—a view radically different from the one generally current in this country.

WILLIAM HEARD KILPATRICK. *The Montessori System Examined.* Boston: Houghton Mifflin Co., 1914. Pp. ix, 72. Thirty-five cents.

Professor Kilpatrick was one of the faculty of Teachers College, Columbia University, who went to Rome to make an intensive study of Madam Montessori's work. His conclusions are that the background of her educational philosophy is to be found in the Rousseau-Pestalozzi-Froebel group, modified by the teachings of Seguin, and, in view of her adherence to the doctrine of formal or general discipline, that she belongs to the mid-nineteenth century, some fifty years behind the present development of educational theory. "In reading and writing it is the letter and the single sound, not the word or thought connection, that receive attention. Sense qualities are taught in isolation, apart from life situations."

IRVING KING. *The High School Age.* Indianapolis: The Bobbs-Merrill Company, 1914. Pp. 233. $1.00 net.

A popular treatment of adolescence in relation to education. After emphasizing the fact that the high school does not hold its pupils, the author describes the physical changes of the adolescent period, gives several concrete cases of difference in rate of development, devotes several chapters to the changes in mental outlook, and urges a more careful study of high school pupils and a better adaptation of the school activities to their needs.

HANNAH T. MCMANUS AND JOHN H. HAAREN. *The Natural Method Readers. A Primer.* New York: Charles Scribner's Sons, 1914. Pp. vi, 122.

"This book consists almost entirely of nursery rhymes and of sentences in which the words of these rhymes occur." It is replete with splendid illustrations.

HELEN MACMURCHY. *Feeble-minded in Ontario. Eighth Report,* 1913. Toronto: L. K. Cameron, 1914. Pp. 30.

A survey of recent work with the feeble-minded, with a discussion of the new British Mental Deficiency Act, and a plea for a training school for the feeble-minded in Ontario.

CHARLES A. MCMURRY. *Conflicting Principles in Education and How to Adjust Them.* Boston: Houghton Mifflin Company 1914. Pp. vi, 290.

Some of these conflicting principles are training in obedience to authority *versus* independent action; firmness *versus* gentleness in dealing with children; reserve *versus* spontaniety; criticism *versus* encouragement; aggressive character of teacher *versus* natural reaction of child; the individual pupil *versus* the social whole; logical continuity *versus* fertility of association; dictation *versus* independent thought; the concrete *versus* the abstract; form *versus* content. In this fashion many of the vital issues of the day are considered, and illustrated from practical school situations.

JOHN M. MECKLIN. *Democracy and Race Friction.* New York: The Macmillan Company, 1914. Pp. xi, 273. $1.25.

The writer's discussion of race traits and race antagonisms, while aimed specifically at the negro problem in this country, receives unexpected confirmation in the present European disturbance, which has developed out of the deep-seated antagonism between the Teuton and the Slav. The book is a scholarly and thoughtful study of the negro situation, and sums up clearly the difficulties in the way of negro development.

E. MEUMANN. *Abriss der experimentellen Pädagogik.* Leipzig: Verlag von Wilhelm Engelmann, 1914. Pp. vii, 461. M. 3. Geb. M. 3.60.

This book is regarded by the author as a supplement to his three-volume "Vorlesungen zur Einführung in die experimentelle Pädagogik." In the larger work he attempted to set forth in detail the experimental results in this field and their pedagogical significance. In the present volume he emphasizes general points of view and

methods of attack. Part I gives a general introduction to paidology, outlines the study of physical and mental development, and discusses the investigation of individual differences and capacities. Part II deals with the mental work of the school child, sketches the present status of the psychology of learning, and reviews the experimental studies in special school subjects. In the latter field the recent work of American investigators seems to have escaped the author's notice altogether.

MARIA MONTESSORI. *Dr. Montessori's Own Handbook.* New York: Frederick A. Stokes Company, 1914. Pp. xii, 121. $1.00 net.

With the flood of Montessori Manuals that is issuing from the press, it is natural that Madam Montessori herself should desire to have something to say about the use of her apparatus and method, and she has therefore prepared this little book as a supplement to her larger *Montessori Method.* This, therefore, is the only authorized Montessori Handbook. The enthusiasm and *naïveté* of the author are again clearly revealed, and her implicit faith in the education of the senses as the highest type of education is seen in the following quotation from the preface: "Helen Keller is a marvelous example of the phenomenon common to all human beings: the possibility of the liberation of the imprisoned spirit of man by the education of the senses. Here lies the basis of the method of education of which the book gives a succinct idea. If only one of the senses sufficed to make of Helen Keller a woman of exceptional culture and a writer, who better than she proves the potency of that method of education which builds on the senses?" Yet Helen Keller might be taken as a shining example of the development of intellect in spite of the most limited sensory equipment, and so be made to prove just the opposite.

CHARLES W. MOORES. *Lincoln: Addresses and Letters.* Cincinnati: The American Book Company, 1914. Pp. 224.

Some of the most characteristic of Lincoln's utterances are here made accessible to the school child.

BARBARA SPOFFORD MORGAN. *The Backward Child.* New York: G. P. Putnam's Sons, 1914. Pp. xvii, 263. $1.25 net.

This is announced as a study of the psychology and treatment of backwardness, a practical manual for teachers and students, and is provided with an introduction by Elizabeth E. Farrell, Superintendent of Ungraded Classes, New York Public Schools. The introduction, which pleads for a more careful study of children's capacities and a better adjustment of school work, and the author's preface arouse expectations which are sadly disappointed by the body of the book. The author seems to be firmly held in the grip of an antiquated faculty psychology, and the tests used for mental diagnosis are crude

and inaccurate in the extreme. The author apologizes for the shortcomings of the book with the plea that this is the first attempt of the sort that has ever been made, but it would seem rather that she had failed to inform herself and take advantage of the work that has already been done in the field of mental testing.

THOMAS MOTT OSBORNE. *Within Prison Walls.* New York: D. Appleton & Co., 1914. Pp. vii, 328. $1.50 net.

This interesting "narrative of personal experience during a week of voluntary confinement in the state prison at Auburn, New York," by the Chairman of the New York State Commission on Prison Reform, has been widely heralded by the newspapers, and is entirely worthy of the favorable comments that have been made on it. The story is dramatic and fascinating from start to finish, and the plea for a more intelligent and humane treatment of prisoners is amply justified both psychologically and ethically. This is not a question of sentimentality, but of economic and social good sense. When it can be so easily shown that society is causing trouble and waste for itself by brutal treatment of prisoners, and that there is much chance of saving by adopting a different method, it is only stupid folly to refuse to try the change. It is true that the old instinctive idea of revenge is hard to eradicate, but if we are to use intelligence at all, let us use it in our treatment of those whom we fear so much that we have to confine them.

E. REGIS ET A. HESNARD. *La psychoanalyse des névroses et des psychoses. Ses applications médicales et extra-médicales.* Paris: Librairie Felix Alcan, 1914. Pp. xii, 384. Fr. 3.50.

This would seem to be the first extended account of psychoanalysis that has appeared in French. The authors make due apologies for presenting the work of German investigators, but beg their readers to keep their minds open, and out of the mass of vagaries and exaggerations clustering around psycho-analysis glean the grains of truth and fact which are profoundly significant for the understanding of many mental disturbances.

CARL E. SEASHORE, Editor. *University of Iowa Studies in Psychology. No. VI.* Psychological Monographs, Vol. XVI, No. 3, 1914. Pp. 177.

All of the papers in this series of studies have to do more or less directly with pitch discrimination. There is a description of an improved form of the tonoscope, by the editor; the use of this instrument to determine the accuracy of the voice in simple pitch singing, by Walter R. Miles; the effect of training in pitch discrimination, by Franklin Orion Smith; the lower limit of tonality, and variation

in pitch discrimination within the tonal range, by Thomas Franklin Vance; and several minor articles. Interestingly enough there is no evidence of any improvement in sensitiveness to pitch as a result of practice.

STEVENSON SMITH, MADGE W. WILKINSON, AND LOVISA C. WAGONER. *A Summary of the Laws of the Several States Governing I.—Marriage and Divorce of the Feeble-Minded, the Epileptic and the Insane. II.—Asexualization. III.—Institutional Commitment and Discharge of the Feeble-Minded and the Epileptic.* Bulletin of the University of Washington, No. 82. Pp. 87.

An extremely valuable digest of the laws relating to the treatment of mental defectives.

WILLIAM STERN. *Psychologie der frühen Kindheit.* Leipzig: Verlag von Quelle und Meyer, 1914. Pp. xii, 372. M. 7. Geb. M. 8.60.

This is the first scientific and systematic study of early childhood to appear in the German language since the literally epoch-making treatise of Preyer thirty-two years ago. The author, who has already published noteworthy books on children's speech, has here undertaken an analysis and description of child behavior from a psychological point of view and in accordance with the principles of modern child study. Moreover, he has carried the narrative beyond the customary three years, and has included the kindergarten period up to the sixth year. He has made free use of material drawn from notebooks kept on the development of his three children, but has treated the subject from a general rather than a biographical standpoint. The result is probably the most complete and reliable discussion of infantile psychology that has yet been produced.

WINIFRED SACKVILLE STONER. *Natural Education.* Childhood and Youth Series. Indianapolis: The Bobbs-Merrill Company, 1914. Pp. 295. $1.00 net.

So much has been published in the newspapers and popular magazines about the wonderful attainments of little Miss Stoner that it is a satisfaction to have from her mother this straightforward account of the daughter's education. The author says in her preface "I am trying to tell how I trained my little daughter, who is not a genius (as some believe) but only a healthy, normal, happy child possessed of unusual physical strength and more knowledge than most children of her age through the help of living close to 'Mother Nature,' and in the company of the great giants 'Observation' and 'Concentration,' and the sprightly fairy 'Interest,' assisted by mortals' best friend, 'Imagination.'" The story is simply and delightfully told, and will be of interest to every mother.

EDGAR JAMES SWIFT. *Learning and Doing.* Childhood and Youth Series. Indianapolis: The Bobbs-Merrill Company, 1914. Pp. 249. $1.00 net.

The author, who was one of the first to subject the learning process to accurate, scientific measurement, generalizes the results of his and other investigations, and applies them to representative types of school work. He thinks that all education should be "learning by doing," and that the laboratory and workshop method should be introduced into all subjects.

GRAHAM WALLAS. *The Great Society.* New York: The Macmillan Company, 1914. Pp. xii, 283. $2.00 net.

Casual inspection of this book leaves the impression that it is a thoughtful and serious study of some of the most important psychological principles at the basis of our social life. The author is not a professional psychologist, but an economist, yet the discussion shows that he has taken pains to inform himself in regard to the prevailing views in modern psychology, and to bring his treatment into accord with its findings. Some of the chapter headings are social psychology, instinct and intelligence, disposition and environment, habit, fear, pleasure, pain and happiness, psychology of the crowd, love and hatred, thought, and in Part II the organization of thought, will, and happiness.

H. G. WELLS. *Social Forces in England and America.* New York: Harper and Brothers, 1914. Pp. 415. $2.00 net.

In this collection of essays the brilliant author ranges over a large diversity of topics from flying machines to the contemporary novel, always shrewd, keen, penetrating, thrusting straight at the heart of the matter. In view of the present developments in Europe his views on war, on aviation, and on the possible collapse of civilization are of special interest. To those who are interested in present-day problems, and who like to have popular fallacies neatly skewered and held up to derision, we commend this pungent book of essays.